142780

MR. PHELAN: Yes.

BY THE WITNESS:

A No, not really. I would expect that some water would interchange, go back and forth, but its rate I would expect to be very slow and very low.

BY MR. PHELAN:

Q Do you know if there are any springs in that area?

A To the best of my knowledge, there are not.

Q Then you would fill the slip with what material?

A We would cover it with clay.

Q To a level of what?

A It would crown slightly above the existing elevations on the side of the Slip so that once it is covered and grassed, the water could run off to the sides and be drained away.

Q The water you expect would hit it and drain off rather than going down?

A That is correct.

Q And that would be true all the way up to the slurry wall or up the slurry wall to the sheet piling?

A Roughly, yes. It would taper in two dimensions.

Q But it would run from the farthest northwest

point of Slip 3 all the way up to the mouth, up to the actual permanent sheet piling?

A Once we get up to the permanent sheet piling, we probably would lay some blacktop so that people could have access to any slip they were putting in that bulkhead.

Q You would in no way change Alternative A-3a other than to remove the material to Slip 3?

A Which option are we on now?

Q Well, this option that contemplates the use of A-3a, is that right?

A I am confused.

MR. HYNES: I don't understand the question.

BY MR. PHELAN:

Q Your option, Alternative A-3b and B-2a is similar to Alternative A-3a, is that right?

MR. HYNES: You mean with respect to the other elements of it other than using Slip 3 as a containment cell, rather than --

MR. PHELAN: I am trying to find out with this alternate what specifically you do with the Ditch and the Oval and the Crescent.

BY THE WITNESS:

A Yes. In that regard to the Upland complex, it

would be the same.

BY MR. PHELAN:

Q As A-3a?

A That is correct.

Q Is there just one A-3a?

A It's part of a set.

Q No, there is A-3a-1. You say A-3b is similar to Alternative A-3a, but there is no Alternative A-3a. It is just A-3a-1 --

A Yes, or A-3a-2 or A-3a-3.

Q I understand that, but your memorandum says Alternative A-3a and there is no such, A-3a.

A Well, I would interpret it differently, but it is an editorial comment of no significance.

Q It says A-3a but there is no A-3a. We are using A-3a-1, 2 and 3, is that right?

A Yes. If you would like to substitute A-3a-1 or -2 or -3 for the words A-3a, be my guest.

Q All right. So you could use either A-3a-1, -2 or -3 here?

A I believe they are all the same.

(Discussion off the record.)

(At 11:45 o'clock a.m., a lunch recess was taken to 1:15 o'clock p.m., this same day.)

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

THE UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	No. 78 C 1004
	)	
OUTBOARD MARINE CORPORATION and MONSANTO COMPANY,	)	
	)	
Defendants.	)	

September 13, 1982,

1:15 o'clock p.m.

The deposition of RICHARD P. BROWNELL resumed pursuant to noon recess at 219 South Dearborn Street, Room 1486, Chicago, Illinois 60604, before Thea L. Urban.

PRESENT:

MR. JAMES T. HYNES,

MR. RICHARD J. PHELAN,

MR. RICHARD J. KISSEL,

MR. BRUCE A. FEATHERSTONE,

MS. BARBARA CHASNOFF.

- - -

RICHARD P. BROWNELL,

called as a witness herein, having been previously duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION (Resumed)

BY MR. PHELAN:

Q I would like to go back if I could to Exhibit 3 and ask you about the dredging of the 21,000 cubic yards.

MR. HYNES: What page are you on?

MR. PHELAN: Page 24.

BY MR. PHELAN:

Q What if any curtaining off or cordoning off would you do of the Upper Harbor if you were dredging the 21,000 cubic yards?

A We would recommend that it be curtained off with a steel sheet pile wall.

Q Is that included in your proposal?

A Yes.

Q Where is that included?

A That is included on Page 24, the second item down, item temporary sheet pile wall for closing Harbor.

Q Where is that located on Page 22? Where would that temporary sheet piling be?

A There are two places that it might be located.

One is below the letter H on Page 22, the letter H in the word Harbor, and the other is above the letter R in the same figure, same word.

My preference would be for the upper limit above the letter R.

Q Would you be good enough to look at Exhibit 12 and give us a segment as shown on Exhibit 12 as to where you would put that?

A My preference would be on a line approximately where the B-2 and B-3 segments coincide on Exhibit 12.

Q What kind of sheet piling would this be and how deeply do you pound it?

A It would be as before: Sheet piling that we would tie into the clay layer by several feet, so we would have 30 or maybe 40 feet of sheet piling depending on exactly where the clay is.

Q That would be from the west to the east?

A That is correct.

Q When you pump from the Upper Harbor, the pumping would be done right from the bottom of the sediments up to the surface and then a pipeline from Slip 3 northwest of the temporary sheet piling?

A Yes.

Q The area around Slip 3, that is the present

sheet piling that is in there. Now, in your opinion, is that sheet piling of an adequate substance and in such condition that it need not have any further support or insulation if it is to be a containment site?

A As we have described this option, we don't envision there will be any need to augment that sheet piling.

Q Have you looked at that sheet piling and examined it to see whether in fact it is leaking or whether it adequately would be a containment site?

A The sheet piling will leak even if it is brand new and will pass some water, but as we discussed in some of the earlier days, the mechanism for PCBs to leave the containment site in this area would be a difference in water elevations between the Harbor and the containment site.

Since we expect that that will be a minimum difference if there is one at all, it is quite possible there could be a reverse gradient. We don't envision there will be significant movement of the PCBs out of that area into the Harbor through the walls.

Q Is there any drainage around the Slip 3, either by groundwater or rainwater carrying any material

into the Harbor presently?

A Yes.

Q That would not interfere with the containment in Slip 3?

A That would have to be rerouted so that it would not interfere.

Q Is that taken care of in your estimates?

A Yes, we have made allowance for it.

Q The slurry wall essentially, the need for the slurry wall is to have a place for the treatment of the water that is going of necessity to be pumped in there as a result of the dredging?

A The slurry wall, let me back up. Right now on three sides of the Slip, the sheet piling is surrounded by soil and so that anything that tries to leave from the area, and let us say is driven or diffuses through the sheet piling, then has a very long distance of soil that it has to contend with before it can intercept with the Harbor. That soil also for PCBs provides a capability for some absorption of the PCBs on the site of the soil particles.

When we drive the sheet pile wall across the front, we don't necessarily have the equivalence, if you will, of that soil all around. The double sheet

piling wall with the slurry wall in between gives us that equivalence and then some.

The fact that we are going to have a change in the water levels, the water treatment plant behind this double sheet piling wall is another reason to put that in because we really don't want the water rushing in and out if we change the water level in the treatment area. So there are really kind of two reasons to do it and we feel that it adds a protection to the concept as we have described it and estimated it.

Q The 10,100 cubic yards that you were going to move under this option from the North Ditch and parking lot is the same 10,100 we talked about before?

A Yes.

Q Is there any difference in the storm drain location here as there was before, the same route?

A I believe so.

Q 48 inches in diameter along the north?

A We are still on A-3?

Q A-3b.

A Yes, I believe so.

Q Again, what is the reduction here in the amount of PCBs that are in the environment as a result of execution of Option A-3b?

A From the North Ditch area?

Q From the North Ditch area, right.

A Roughly 75 percent, say, 400,000 pounds as a rough estimate we made, somewhere in that range. It could vary.

Q Again, the basis for that benefit is Mason and Hanger soil borings?

A That was one basis. We laid it out and then we did estimates as to what influence of area we thought was affected by each boring or set of borings and made calculations as to how much PCB was in each sub-area.

Q Are the dangers in the North Ditch of the same degree as those in the Upper Harbor and the Slip 3?

A The dangers?

Q Yes, of leaving PCBs in the Crescent and the Lagoon and the Ditch?

MR. HYNES: I don't understand.

BY MR. PHELAN:

Q The dangers that you have outlined as the basis for moving, dredging or encapsulation are a flood, spill of a petrochemical?

A Vehicle.

Q You have eliminated earthquakes?

A I never had them.

Q All right. I had them and you eliminated them and commercial navigation. Those were the two or three, depending on how you look at it, perils that in your opinion warranted some remediation option in the Upper Harbor and Slip 3. Are those the same options except for the navigation that require some remediation option in the Ditch and Lagoon and Crescent?

A I believe as I deposed earlier, there is another one in the North Ditch area and which is if a vehicle could run off the road and disturb the soil and those areas where the PCBs were within six inches of the surface.

Q Do you think the danger of a flood causing movement of the PCBs is the same, greater or less as a result of placing it, encapsulating the material in Slip No. 3 as proposed under A-3a?

MR. HYNES: Could you repeat the question?

(Question read.)

THE WITNESS: You mean B-3a?

BY MR. PHELAN:

Q B-3a, yes.

A I'd say they are equally well protected from floods. We had put in riprap as we talked about before

on the above-grade landfill. That would have to be maintained just as the outer walls or wall of the Slip 3 containment area would have to be maintained so the sheet piling would have to be maintained.

There might be an ever-so-slight difference in that Slip 3 is farther away from the Lake so that anything flood-wise induced from the Lake might give the slight advantage to Slip 3, but then any water coming in from the land side, the other option, the above-grade landfill would give more protection.

I'd say they are fairly equivalent.

Q You were comparing containment versus the containment cell?

A The above-grade landfill with the Slip 3 cell.

Q What about leaving the PCBs where they are versus the containment cell in terms of flood?

MR. HYNES: What containment cell? In Slip 3?

MR. PHELAN: No, let me finish.

BY MR. PHELAN:

Q Just consider the peril as you see it between leaving the PCBs in Slip 3, Upper Harbor just where they are and not doing anything, absolutely nothing, versus putting them in a containment cell and tell me what you perceive as the difference if any in danger

from a flood in their moving either from a containment cell or from sediments in the Harbor where they are presently located?

A Has to be greater.

Q How much?

A Significantly greater.

Q How do you measure?

A I think it is a qualitative judgment.

Q How do you make the judgment?

A Based on all the factors involved, such as, jumping ahead, if you allow a material which can be suspended and moved by hydraulic forces such as water to be given the opportunity to be in close contact with that fluid you then induce a flood or have a flood occur, then in Slip 3 the materials have a very high chance of moving because they are in direct contact with the hydraulic fluid, water, and they will move if you raise Lake levels dramatically as in a flood and then lower them again. It is going to move and if the water moves, the sediment is going to move and if the sediments move, the PCBs are going to move.

Q How much of the sediment is likely to move under any one of the perils that you anticipate require these remedial options?

A I am not sure, but even if it is only a couple of percent, we might have 10,000 pounds of PCBs leave out of Slip 3 and be roiled up in the water column and a significant fraction of that go right out to the Lake, could be decades if not centuries of discharge at the current rate.

Q Do you know how much PCBs there are in the first three inches or four inches of sediment?

A Of the sediment?

Q Yes.

A What do you define as the sediment?

Q I am using it broadly. I assume to include everything on the bottom which is otherwise not moving, not in flux.

A I believe a muck layer is first and then the top three or four inches, I would not expect that to be a very high level of PCBs in that muck, but I have no idea what that value is.

Once you go below the muck, when you go deeper --

Q How much muck would you expect to move in a flood that would have this hydraulic effect of moving the muck?

A I have no calculations on that, but even if it

is a few percent of PCBs, which doesn't mean you have to have a large amount of the sediment move; it doesn't even have to move that far. If you roil it up and get it in the water column or get the finer particles up into the water column, those particles are going to move.

Q Have you seen any reports or studies that show what happens to muck in a flood or a Class A or Class B flood?

A I have --

MR. HYNES: Excuse me, do you know what a Class A or Class B is?

I am not sure he knows what a Class A or Class B flood is.

BY THE WITNESS:

A No, I don't know what a Class A or Class B flood is, but irrespective --

MR. HYNES: If you don't know what a Class A or Class B flood is, I think Mr. Phelan should define what those are so you can answer the question.

MR. PHELAN: He has an answer regardless.

MR. HYNES: What is a Class A and Class B?

BY MR. PHELAN:

Q Go ahead and answer. Mr. Hynes has already

made his objection.

MR. HYNES: Without the Class A or Class B flood assumptions in there.

BY THE WITNESS:

A Irrespective of the type of flood, there has been a lot of work on the movement of water and how it affects sediment, where the water is moving. There is a tremendous potential for moving water to resuspend material and move it.

BY MR. PHELAN:

Q I am not disagreeing with that. I am asking how much of the muck moves in a flood. I said Class A or Class B and you seem to think, at least from what I understand you are saying, that some of the muck may move but a very small percentage of that which is below the muck may move. Am I correct?

A I said I did not know. I said that even if a small percentage moved, you could easily have 10,000 pounds of PCBs leave the area which is a catastrophic loss.

Q You don't know that unless you know how much is in the layer immediately below the muck and you know how much muck has moved during a flood, isn't that true?

A There is potential for movement during the

flood. There are all sorts of perils as you have outlined before while you are holding me to one now.

Q I didn't disagree with that. I just said until you know in any kind of flood how much of the sediment including muck is actually moved and where the PCBs are located and in what distribution, you cannot opine the extent to which any flood is going to actually move those PCBs. Isn't that true?

A At this point, all I can do is give you a general common sense answer based on my engineering experience that there will be movement.

Q I am not saying that you cannot give me a common sense engineering answer. I am saying isn't it a fact that given your opinion with any precision you have to know how much muck or sediment will move in a flood and you have to know the concentration of PCBs either in the muck or in the sediment below the muck.

A I disagree. I think there is enough information here to say there is enough PCBs around with any serious storm event of a hydraulic nature, you are going to get movement and any movement has to be significant, even if it moves a small percentage of material.

Q Let us analyze the first part of your statement. You agree that in the muck itself there probably are few

PCBs.

A In the top three or four inches.

Q In the top three or four inches.

Do you know either based on your study in similar harbors or studies in Waukegan Harbor, the size or the depth of the muck in Slip 3 in the Harbor?

A There has been some information presented in the Mason and Hanger reports on the depth of the muck layer. I don't recollect offhand how deep it is. I would be happy to refresh myself if it is important.

Q Do you agree with me it is deeper or thicker than three or four inches?

A Yes.

Q Isn't it a safe assumption that even under a severe flood, that muck layer, the entire muck layer extending beyond three or four inches would probably not move?

A No, it is not.

Q You wouldn't agree with my assumption?

A No, I would not.

Q Would you agree that if the muck layer extended even to six inches, it is highly unlikely that little if any of the sediment below would ever in fact be moved?

A Under what conditions?

Q Under a severe flood.

A Oh, I know of cases in the Colorado River where the water --

Q Wait a minute. You are talking about a river. We are talking about a harbor now.

A Let me finish. If you can have your extreme --

Q No, no. If you disagree with that assumption, Mr. Brownell, you can just say so.

A I disagree with that assumption.

Q What is the basis for your disagreement?

A Based on my knowledge as a civil engineer and as to how much movement of sediment you can have with movement of water.

If you move significant amounts of water during a flood situation, you can have scours of 10 or 15 feet very easily. You don't have to do it very long, particularly if the material is as mobile as muck potentially is.

Q Have you seen any recorded flood in the Great Plains area and even in the Chicago-Wisconsin-Michigan area that even approached a minor flood?

A I have not reviewed the flood information over that broad an area.

Q In the dredging of the 21,000 cubic yards

under the Harbor on Option B-2a, again the benefits and risks, the immediate dispersal of PCBs into the environment through the air and the water column all weighed into these remediation options, didn't they?

A We gave them consideration.

Q And your answers to the amounts of PCBs that are volatilized and find their way into the air column here with the 21,000 cubic yards were the same as they were in the other question, the previous options?

A It would be slightly more.

Q Roughly how much more?

A It could be another, say, 20 pounds, 10 to 20 pounds.

Q Do you think that much PCB would be released in the air under any of the scenarios you contemplate in a petrochemical spill in the Harbor which would cause some changes in the PCB layer that is one of the perils against which you are protecting yourself here?

A Into the air?

Q Into the air and into the water column.

A Into the water column, I would expect there were many times that, many times.

Q You would expect that once in the water column, it would probably settle down again or as I presume on

the basis of your study of Dr. Thomann, some of that would migrate out into the Lower Harbor?

A Most of it would because it would be much more soluble.

Q Based on Dr. Thomann?

A No, that is based on my knowledge of how the PCBs would be dissolved in the petrochemical, so the majority of it would become mobile, soluble, move and leave.

Q How much of it would go into the air column and volatilize?

A I would have to think about that because it becomes a little more complicated making calculations and I can't do it mentally.

Q Would you be of the opinion that unless it would be a gigantic spill, you wouldn't get anywhere near the volatilization you would get in this dredging process of 21,000 cubic yards?

A No, I wouldn't make that --

Q You would not be willing to go that far?

A No. I could see how if you put petrochemicals into the Slip that you might drive, let's say, the present solubility, present soluble PCB levels are on the order of one part per billion. I could see we go

to a thousand parts per billion in the water column which means that potentially your volatilization could go up a thousandfold. I am not sure. You have to look at more.

Q What petrochemicals are included in that risk/benefit analysis you are using?

A One of them that comes to mind is gasoline.

Q How much gasoline in your opinion goes up to Slip 3 or the Upper Harbor before we have a peril?

A I would say that a couple of hundred gallons would be quite significant potentially.

Q A couple of hundred gallons is significant anytime. How much has to go in in your opinion to support this kind of peril that we are guarding against? How much gasoline?

A A couple hundred gallons.

Q And if 200 gallons went into Slip 3, would it have to go in one specific area or generally dispersed or what?

MR. HYNES: You mean will it go in one spot or --

MR. PHELAN: If we have a guy with a gas pump right there in Slip 3.

BY THE WITNESS:

A I don't know what kind of loonies you have

around here.

MR. PHELAN: I don't know anyone who walks around with 200 gallons of gasoline on their backs.

THE WITNESS: Never crossed my mind.

BY THE WITNESS:

A Would you pour it in one spot or just spray it like a hose?

MR. HYNES: Is your question does it make any difference if it is poured in one spot or sprayed in an even flow?

MR. PHELAN: I assume it has to be poured in one spot. You wouldn't spray that.

MR. HYNES: That's what you want?

MR. PHELAN: Yes.

BY THE WITNESS:

A It is my understanding that most spills result in material being dropped into the area of concern in a relatively small area.

BY MR. PHELAN:

Q In your opinion, what happens when the gasoline enters the water? Does it go directly to the sediment, does it stay on the top or what?

A A lot of it will stay on the top. A lot of it will be mixed in with the water column, be dispersed

into the sediments and start to dissolve PCBs.

Q How long does that process take?

A I have not made any calculations or estimates as to how much it takes.

Q It doesn't happen overnight, does it?

A It might, yes.

Q Do you have any idea as to how much gasoline has already gone into Slip 3 out in the Upper Harbor?

A In a spill? I have no idea.

Q Any other petrochemicals beside gasoline included in your opinion?

A I would think there are probably a thousand or two thousand that might qualify, but I am not familiar with what OMC uses and what specifically intends to go in or will go in in the future and also what Larsen uses or will use in the future.

Q Have you looked at any of the other chemicals that are used by any of the other persons along Waukegan Harbor?

A I haven't had access to that information.

Q Incidentally, how many PCBs do you think would be released if you poured 200 gallons of gasoline directly into Slip 3 tomorrow?

A And get the best contact possible?

Q Some guy just decides to be a vandal and decides to pour gasoline in Slip 3 and right at the top, pick a point.

A I have not made a calculation.

Q In A-3, let us say he pours it in A-3 on Exhibit 12. What would you expect it would either volatilize or go into the water column?

A I have made no calculations.

Q Can you give me any idea?

A No.

Q Other than the hundred or two thousand other chemicals, is there any one chemical more than any other that comes to your mind as being included in this peril?

A No.

Q Is the fact that over all these years Larsen Marina has existed, there has never been, at least from what we can gather now, the kind of phenomenon that we are anticipating in any moment or await your evaluation?

A I disagree with the statement. I don't know that it hasn't happened. There have not been any measurements for the first 20 years when massive amounts of PCBs were known to be discharged in the Slip. No one has any idea what the solubilities were or what other

practices were at that time or what was occurring in the Harbor.

Q You said known to have been passed into Slip 3?

A Yes.

Q On what basis do you say that?

A From all the information that I have read in the various reports where it has been indicated that OMC has used PCBs and has discharged them out through that outfall and they stopped in the early '70s.

Q Do you have any specific reference?

A None comes to mind. I have read a lot of material on this project. I have seen it several places.

Q Incidentally, how would you calculate the amount of PCBs generated by pouring 200 gallons of gasoline into Slip 3 at any particular point?

A It would be difficult to calculate.

Q Can you calculate it?

A If I had enough information, I could.

Q Well, the information that you have read in Exhibit No. 12. What else would you need?

A I would have to sit down and think and see if there were additional information or not.

Q What would be the manner of calculation?

A I'm sure there is one. I just don't have it on the top of my head.

Q Do you know if anybody else ever tried to calculate that?

A I know that calculations have been made as to solubility of PCBs and other petrochemicals and all you have to do is contact it for a short period of time and it will become soluble, but I can't recollect the chemicals.

Q The construction of the Larsen Marina, how was that number of 748,000 arrived at?

MR. HYNES: Back on Page 25?

MR. PHELAN: 25.

BY THE WITNESS:

A What we started with is the basic premise, is to provide to the Marina the same amount of linear feet of dock space that they currently have, which in essence is the north wall of Slip 3. We had that calculation. We then were able to size the Slip which would have the same linear feet of slip space. We also included the space along the new sheet piling wall that we were going to put in between B-1 and A-6.

Once we sized a possible slip configuration,

we then made an estimate for the sheet piling that would be needed and the amount of excavation that would be required and then made a lump sum allocation for relocating docks and putting in new docks and utilities.

BY MR. PHELAN:

Q The backup for that lump sum of 350,000, do you know what that is?

A No, I do not.

Q Is there any amount of money there for the cost of the land?

A No.

Q I presume Mr. Mulligan knows what makes up the 350,000?

A If you wish.

Q Do you?

MR. HYNES: Does he know himself or does he know if Mulligan knows?

MR. PHELAN: I think he said, I asked him if Mr. Mulligan knew and he said "if you wish."

I am assuming --

BY THE WITNESS:

A Well, it doesn't matter.

BY MR. PHELAN:

Q Does Mulligan know the elements?

A Well, when we make an estimate of lump sum, LS, it is either based on an addition of a lot of small elements and adding a factor for running it off, or we just made an allocation and picked a number that based on this area and everything, we think it is reasonable for relocating utilities and everything else.

I am not sure how Mr. Mulligan did this particular calculation on this particular page, it being one of 50 pages or so.

Q Do you know what makes up the 350,000?

A I believe I have answered no, other than stating for new docks, utilities and relocating existing finger docks where it appears and what we think is required to put Mr. Larsen back in business in pretty much the same configuration that he is in now.

Q The steel sheet pile left in place, this would be left for the construction of the new configuration on Item 22 of Exhibit 3?

A Yes.

Q Incidentally, what would you do with the material you excavate from that new Slip 3?

A There are two options: One is to dispose of it off site --

Q Are these included in your estimate?

A Yes. There is a possibility that some parts of that material could be used in filling in the North Ditch and the Crescent and Oval Lagoon areas and also a possibility some of the material might be used in bringing Slip 3 up to final grade, so it is conceivable that we would not have to relocate it off site and in fact, we tried to use a lot of it on site.

Q That is the 14,100 cubic yards?

A I believe it is. Let me just double check -- 14,000 cubic yards.

Q Just going back for a minute in the encapsulation, when the water is pumped into the area between the slurry wall and the temporary sheet pile wall, is that where it is anticipated that the water will be filtered or treated so that it can either be returned directly to the Harbor --

A I think the way you posed the question is perhaps not --

Q You can answer it yes or no, Mr. Brownell.

A Well, I don't understand the question.

Q Where would you place the water that you pump from the Harbor which contains the sediment which you are dredging in Slip 3?

A It would be in the northeastern end of Slip 3

beyond the farthest temporary wall. That is where we would go initially.

Q Is that on the northwest side?

A I am sorry, the northwestern end of the Slip.

Q The far northwestern end of the Slip?

A Yes, I misunderstood.

Q Where would you treat that water that is in the far northwestern end of the Slip?

A It would flow back towards the Upper Harbor and in the course of it flowing back towards the Upper Harbor or pumped back, it would go through the water treatment plant which would be between the two temporary sheet piling walls I described earlier.

Q That is where you would treat it?

A Yes.

Q My original question was between the temporary sheet piling and the slurry wall or between the permanent sheet piling and the slurry wall?

A I don't think so.

Q Wait a minute. I don't think so? I am asking which side. Is it north and west of the slurry wall or south and east?

A There is a permanent sheet pile wall and then a slurry wall and then a temporary sheet pile wall.

Q Right.

A The water treatment plant will be to the northwest of the aforementioned temporary sheet pile wall and southeast of the next temporary sheet pile wall.

Q But the slurry wall was in between?

A That is correct.

Q That's true, you put it in.

You have a permanent steel piling; then you have a slurry wall; then you have a temporary steel piling and then you have another temporary steel piling?

A Yes.

Q It is between the two temporary?

A Yes.

Q When the water reaches that point, how would you return it to the Harbor after you have treated it?

A We will try to return it by, let me check --

(Messrs. Phelan and Kissel conferred.)

THE WITNESS: I don't think so.

MR. HYNES: Don't answer their mumblings.

BY THE WITNESS:

A Most likely it would be pumped back.

BY MR. PHELAN:

Q Most likely what?

A It would be pumped back.

Q What parts per million would you pump it back, how little?

A We would expect that after treatment that the PCB concentration would be in the 20 to 30 ppb range.

Q On your Item 22, you show --

MR. HYNES: Page 22?

BY MR. PHELAN:

Q Item 22 of Exhibit 3, you show a permanent steel piling.

A Yes.

Q Then you show another broken line.

A Yes.

Q Then you show the settlement basin?

A Yes.

Q Where there, looking there, where is your slurry wall?

A We have two lines drawn together here and it is so close, it is hard to see where it is, but your slurry wall is in between two sheet piling walls as described in the words on Item 21.

Q But after you put in the temporary sheet pile wall, you expect to put another one in north and west of

that one, don't you?

A Yes.

Q How far north and west of that one?

A I would say about a hundred feet, roughly.

Q What is the distance of the Slip from northwest to the southeast?

A Gee, all I can remember is the surface area is 1.6 acres, but if we scale off, it is close to 600 feet.

Q Assuming the 600 feet, you would then have a permanent steel piling. 15 feet you would have the temporary. In between the temporary, you would have the 3-foot slurry wall.

A Between the temporary and the permanent, yes.

Q So you have 12 feet or 6 feet on either side of the slurry wall?

A Yes.

Q Then from the temporary sheet piling, you go another 100 feet into the Slip which is your water treatment?

A Yes.

Q That is known on Item 22 as your settling basin?

A Yes.

Q So what is shown here on Item 22 as a settlement basin is north and west of a temporary steel piling, slurry wall and permanent steel piling, do I have it?

A Yes, I believe so.

Q You were going to give us the numbers to include. The questions I asked you this morning, that is the calculation as to the Harbor and the Ditch.

A I believe, let us go back and see what option we were on.

Q Not the same one.

A Should we go back and check then?

MR. HYNES: That is under A-3a-2 and B-3b.

BY THE WITNESS:

A Roughly there would be about 10 pounds of volatilization from the North Ditch Upland area in the course of removal of highly contaminated material and during the dredging activities, there might be roughly 40 to 60 pounds, 65 pounds, somewhere in that range.

BY MR. PHELAN:

Q All right.

MR. FEATHERSTONE: May I hear the answer back?

MR. PHELAN: 40 to 60 pounds in the Harbor and 10 in the Ditch.

BY MR. PHELAN:

Q That is all due to volatilization?

A Yes, and the 40 to 65 also includes the poundage during the operation and covering of the containment area, so some of that has to be allocated theoretically back to the North Ditch. But these are very rough calculations and to make that refinement would not be precise.

Q How do you determine where the new slip should be located in terms of your B-2a?

A We tried to find an area, select an area that would be as close as possible to Larsen's existing operations and that seems to be the closest piece of land, although not owned by Larsen.

Q Is that the only criterion used?

A Another criterion was to get at least some of the slips out of the main channel as they are now in Slip 3 for whatever value that may have relative to waves.

Q There was a rerouting of OMC's intake pipe under your Option B-2a.

A Yes.

Q Can you tell us what criterion you used for rerouting of OMC's intake?

A Currently it is in Slip 3. It has to be moved

if we are going to use Slip 3 as a containment site.

What we are looking for, the main criterion is a place which would result in the least disruption to Harbor activities during its construction and its use. To be conservative, it was located in Slip 1.

Q Was there any other option other than to run it down the road there in Slip 1?

A It is possible to run it along Seahorse Drive to the east and then try and go down into the new slip area. That is another possibility. The distance would be slightly shorter, but you would have more utilities to contend with, so we picked the more conservative from the cost point of view of the two options.

Q Did you consider the capability of the intake pipe right now?

A Capability? I don't understand, capability towards what end?

Q Bringing in the water. Do you know what it is capable of bringing in on a daily basis?

A I don't recollect.

Q Do you know whether movement in the area and by the method that you have sought to do it would reduce the head loss and the water level loss, thus not allowing

the pumps to bring the water in from the Lake?

A We would make the pipes big enough so the net loss would be equivalent.

Q Do you know what the capability is for the actual operation?

A No, it is possible that the pump's impellers might have to be changed in the pumps and more horse-power utilized.

Q If I told you a million and a half gallons were pumped through Slip 3 every day, would that in any way affect the extent to which you think the sediments in the bottom may or may not be moved?

A Under normal circumstances, it wouldn't because a million and a half gallons is not a surprise to me.

Q Would that hydraulics in any way tend to move the sediments and muck, to your knowledge?

A I don't believe so. I believe the cross section of the velocity is so low you are not going to get any movement. You will in the top few inches perhaps, but we don't think there is much PCBs there anyway.

Q Slip 3?

A Yes.

Q You have air and water monitoring during dredging. What is the purpose of that under Alternative

B-2a, Item 24?

MR. HYNES: Page 24, right?

MR. PHELAN: Yes.

BY THE WITNESS:

A The purpose is to monitor PCB levels during dredging activities.

BY MR. PHELAN:

Q Is that as you have described it for the purpose of the treatment plant and the volatilization and so for?

A Yes.

Q If during the process you found that they were volatilizing at a rate of 65 to 125 or 130 pounds, would that incline you to continue with the dredging operation, stop the dredging operation or dredge faster?

A Let me think about that.

One thing it would do is suggest that we should take some additional mitigation measures in the containment area so that the volatilization there can be reduced. Insofar as dredging, it would tell me, it would suggest to me that we may be running into materials which are more contaminated than we had thought which is more reason to get them out because there would be more PCBs in the area than we thought or that we thought

originally.

It could conceivably lead to a decision to dredge more during the cooler hours of the day when the volatilization would be reduced slightly or perhaps try and move it to a period where the water temperatures were significantly less as opposed to if for some reason we were dredging in the summertime as opposed to the springtime when we preferred to dredge, then I would say we would have to postpone dredging.

Q Does the volatilization tell you anything about the distribution of PCBs in the sediment?

A Only indirectly and vaguely.

Q Does it tell you anything about the amount of PCBs that are in the sediment?

A Only vaguely and indirectly.

Q Does it tell you anything more about the danger involved in dredging as you perceived it?

A As I perceive it, the more volatilization you have, then the more risk that you have over short term. And all of this, however, we are comparing the volatilization that would occur in construction rather than the volatilization that was occurring most likely in the past when direct discharges were occurring to Slip 3.

Q It is your testimony, I think, that if 40 to

65 pounds volatilize in the Harbor and 10 pounds in the Ditch or a total on the maximum end of 75 pounds, that is approximately three times as much as Dr. Thomann suspects happens in a year, given his grossest and worst case analysis of the migration of PCBs, isn't it?

A I believe that is an incomplete statement, but as incompletely stated by you, yes. I believe a more complete answer would be when you consider the volatilization that most likely is occurring in the Harbor area and the North Ditch area now and the losses that are occurring in the North Ditch and the losses that are occurring in the Harbor now, that we are up probably around 50 pounds per year and then hence 75 pounds would be one and a half times.

Q We don't actually know if we are losing any PCBs, do we, Mr. Brownell?

A I believe we do, yes.

Q Can you point to any test with a reasonable degree of environmental engineering certainty that shows that PCBs are migrating from the Harbor to the Lake?

A As soon as you have PCB concentrations in the water column, there have been tests conducted that show that the water tends to go out on the surface layers. So therefore, PCBs must be leaving.

Q It is theoretical, isn't it?

A It is not theoretical. There are measurements made as to how the flow of water is occurring. Those measurements were taken in a real-time basis.

Q Are you saying that the matriculation of PCBs through the water column is a sure sign scientifically that once there is smoke, there is fire?

A In this particular case, yes.

Q Does Dr. Thomann agree with that?

A I have no idea. You've got it in the water column. The PCBs have to leave either by air or by water.

Q Are you certain that the tests show that PCBs are in the water column?

A I am.

Q Is Dr. Thomann?

A I have no idea.

Q Do you think it is important for you to know whether Dr. Thomann makes those findings in order to give the opinions you are giving here?

A Let me back up. I know that HydroQual, who Dr. Thomann is part of, has written reports saying that PCBs are leaving and I guess indirectly, one can therefore say Dr. Thomann has some thoughts that there

are PCBs leaving.

As to what exactly his thoughts are and how strongly he is on them, I don't know, but Hydro-Qual has written there are PCBs leaving and yes, I think it is important that you know there are PCBs leaving.

But even if they are not leaving, the opportunity to leave still exists and if we have any of the perils that I have described before, we could have a loss of PCBs that is in my opinion, could represent decades if not centuries of normal losses.

Q I think I asked you this before and maybe you have given some thought since I asked you, but in our past examination, I asked you if there were any accurate ways of testing migration of PCBs in and out. I think you described a piping sample situation.

A I recollect that. I have not thought about that any more.

Q You have not thought about that so your answer about how it would be done and how you interpret the results as it stands, you haven't gotten any further thoughts on that?

A Up to this time I haven't.

Q Do you expect to do any further study on that?

A I haven't decided yet.

Q When will you decide?

A I am not sure.

Q When will you be sure?

A Maybe in a couple of weeks.

Q Be sure and tell Mr. Mulligan and Mr. Henningson so we know what you are going to do.

On B-2a and A-3b, you have samples of groundwater samples, water samples and analysis, inspection and annual report.

How long are you going to test under that scenario?

A The testing and monitoring would continue for the life of the project.

Q What specifically are you attempting to learn as a result of that testing?

A The testing is oriented towards monitoring the proposed containment site so that we can feel comfortable that it is performing as it was expected to perform.

Q In the containment site, where would you put your monitors for the encapsulation?

A We would position them several places around the Slip. We would also probably take some samples, a

couple of samples out of the Upper Harbor water column.

Q The ones around the Slip except for those in the Harbor would be for groundwater?

A Yes.

Q The ones in the Upper Harbor would be for what?

A Surface water.

Q What would you be attempting to learn in the Upper Harbor as attempting to sample?

MR. HYNES: You mean the surface water?

MR. PHELAN: Surface water.

BY THE WITNESS:

A That the PCB levels are not rising.

BY MR. PHELAN:

Q And if they are?

A Then you would have to investigate as to where the source was if the rise was significant.

Q What is significant?

A Either a long term increase or a short term, let us say a two-year increase of a high percent.

Q What is a high percent?

A Depends on where we start from.

Q Where do you expect to start from?

A I believe that the concentrations in the Upper

Harbor should be down in the parts per trillion range.

Q What would be --

A Let me back up. It would be under one part per billion significantly. I would suspect and hope they would be somewhere around a tenth or so part per billion which would be 100 parts per trillion.

Q What do you consider as significant if you start with that data base?

A It is hard to answer that. You need to look at all the data. You cannot look at the surface water data alone. You would have to look at the groundwater data. You would have to inspect the site and see if the sheet piling has a hole in it because someone rammed it with a boat or something else along that nature to see if there is a related cause. You have to check the data.

Q What would cause you to look at the sheet piling? How much would you have to see before you started looking at the sheet piling?

A Looking at the sheet piling would be part of the annual inspection.

Q I thought that is what you would do in order to see if it is significant?

A Do both.

Q What is a significant number then?

A I would say starting in the tenth of a part per billion range that a five-fold increase would be significant. That is over a short term. If it is the same, it might be even lower. Say it is a small creeping change that occurs over five or ten years.

Q Under Item 25, you have your water treatment facilities, that 6,000 square feet of sheet pile, is that the northwesterly wall within your Slip 3 there?

A Down at the bottom, yes, it is.

Q The restoration work is the final cover over Slip 3?

A Yes.

Q What utilities are you relocating in Slip 3 other than the intake pipe?

A We expect that there are some other storm drains up here, here, here and here in this area. (Indicating.)

There are most likely some electrical conduits coming along here. There is also a storm drain that comes in right around here somewhere.

Q These "heres," you are indicating what, the A segments in Slip 3?

A Yes.

Q The modification of the intake pump, where did that figure come from, the $10,000 figure?

A I would assume that is based on Mr. Mulligan's estimate as to what it would take to rehab pumps that are pumping the kind of flow that OMC has been documented as taking, to upgrade them in size, hopefully to do with impeller changes, but it may require both an impeller change and motor change.

Hopefully it will make the pipe big enough so we will not have to do that, but we have not studied the hydraulics in the detail that we would during design and tried to make allowances for allowing in the worst case.

Q In your construction schedule for B-2a and A-3b, you construct a new slip for Larsen second. Do you expect to stir up any problems in the Harbor as a result of construction of that slip first?

A No.

Q Where would you place the material, the material that you have excavated from Larsen during the construction period?

A It would be placed in a vacant land that OMC has. If it is predetermined that there is no place to utilize it on site, then conceivably we will dis-

of some of it directly off site instead of stockpiling.

Q I am still a little confused as to the water treatment plant in Slip 3 and the return of the water to the Upper Harbor.

You say in a quote in Item 21:

"Equipment for the additions of polymers would be installed to provide a reasonable degree of settling of the return dredge water, as it passed through this area into the Upper Harbor."

What is referred to as "this area," the 100 feet between the two temporary sheet pilings?

A That treatment area which is 100 by 300, so you go the 300 feet length.

Q That water would be pumped into the Upper Harbor after it was treated with the polymers?

A Well, there are two ways you can do it.

Q How do you propose to do it?

A That is a design detail. My preference would be to pump the water and the slurry into the northwestern part of the dredge and then allow that material to flow by gravity back into the water treatment area, through the flucculation equipment using the same type of controls that we talked about before when we talked about the containment cell and the adjacent water

treatment plant.

Q Let me stop you.

You pump the water into the northwest part of Slip 3 and it is your belief that the water will then matriculate through the steel pilings into this 100 by 300 foot area?

A No, we would allow the water level to rise so it would overflow the weir structure just as we allow the water to rise in the containment cell and overflow the weir structure in the temporary water treatment area.

Q How would you do that?

A You have steel walls so you can build a steel box and hang it off the sheet piling and let the water level rise up, flow into the box through a weir control structure. There would be enough volume in the box so you can use, add polymers. The polymers will contact the solid particles, they then will flocculate and settle in the settling area.

Q How do you take care of the water that is not high enough to reach the box where the polymers are and are behind the temporary sheet piling?

A We are going to be putting in a lot of water in this area for dredging. It won't be any problem to

get the water level up there.

Q I understand that, but what about the water that is in the remaining 500 by 300 feet?

A At the end when we pretty much fill that area up and there is a couple of feet of water, that water will have to be pumped with a portable pump.

Q How do you treat that water?

A Send it back to the treatment plant, lift it with a little diesel-driven portable pump and put it into the same box that it flowed into by gravity.

Q You pump it through the box, is that it?

A Pump it into the box and it would flow by gravity.

Q How big is this box?

A I really don't recollect.

Q But you would take the water out, let the water flow through the box by gravity as you pump it into the Harbor?

A Yes.

Q Then after you pump out of the Harbor, you still have a hole in Slip 3, 300 by 500 feet long. You then take a pump and pump that through the small box?

A Yes, that would be one way of doing it. That

is up to the contractor to come up with.

Q But the point is by going through the box, you are using the water that is --

A You are starting the treatment process, yes.

Q That is the polymers you referred to in Paragraph 3 of Item 21?

A Yes.

MR. PHELAN: Why don't we take a break.

(Brief recess had.)

(Record read.)

BY MR. PHELAN:

Q Let us take a look at Alternative B-2b.

A Yes.

Q The 38,000 cubic yards of material that is, according to your testimony, 99 percent of the PCBs in the Harbor and the Slip?

A Yes, roughly.

Q And under B-2a, that is approximately 97 percent?

A Roughly.

Q Under any circumstances, could you envisage dredging any more than 38,000 cubic yards of material from the Upper Harbor?

A Yes.

Q What would you do in the event that you dredged more than 38,000 cubic yards? Where would you place those?

A I would build a separate containment cell for them or close off more of the Upper Harbor.

Q In B-2b, you would use this in combination with A-3b?

A Could you read it back?

(Question read.)

BY THE WITNESS:

A No.

BY MR. PHELAN:

Q What would you use in this combination?

A A-2.

Q That is the containment cell?

A No, A-2 is construction of new storm draining to divert water from the North Ditch and fill in the Ditch with clean material obtained from off-site sources or other sources.

Q Let us look at A-4, B-4 and then we have A-5 and B-5.

A-4/B-4, why don't you just generally describe A-4 for us, please.

A Under Alternative A-4, an effort would be

made to safely contain all material contaminated with PCBs to approximate level of 50 parts per million. This would be all material that is in the North Ditch Upland complex. The containment would be in a site constructed in the present OMC parking lot area.

Q Incidentally, the total amount of cubic yards is 123,800 cubic yards according to your estimates here.

What is the cost per pound of this remedy?

A For A-4 and B-4 together?

Q Yes.

A I would say about $9 to $10 a pound PCB-contained.

Q That is based on 123,800 cubic yards and a total cost of what?

MR. HYNES: You asked for the cost per pound. Do you mean cost per cubic yard?

MR. PHELAN: No, I asked for cost per pound.

BY THE WITNESS:

A Pound of PCB?

BY MR. PHELAN:

Q Yes, you said $9 or $10 per pound. 123,800 cubic yards is what total cost?

A The total cost is $6.7 million.

Q How did you arrive at the $9 to $10 per pound?

A I took the roughly 400,000 pounds that are in the North Ditch Upland complex and added it to the 300,000 pounds --

(Messrs. Phelan and Kissel conferred.)

THE WITNESS: I am sorry. I can't talk and read his lips at the same time.

MR. KISSEL: When I want you to read them, you'll know.

BY MR. PHELAN:

Q I am sorry, the total cost of six to seven million in there, you arrive at $9 or $10 per pound?

A Yes.

Q Before you go through your mathematics, let me point out what I think may be a mistake. The Alternative B-4 cost estimate, Item 37, look at the math there and look at the math on Item A-4.

A Thank you.

Q What is the total cost for A-4?

A It appears to be $7.3 million.

Q Just A-4?

A Yes.

Q $7.3?

A Roughly. I did not go through all the math, but I believe there was a typo and the two should have been seven.

Q What about B-4. Is B-4 correct?

A I believe so.

Q So the total cost of this remedy is $7.3 million plus $4.3 million?

A $4.4 million, right, for $11.7 million roughly.

Q Now, using that number what is your cost per pound?

A It's approximately $17 a pound of PCBs.

MR. FEATHERSTONE: Did you say that was a typo?

THE WITNESS: Yes.

MR. FEATHERSTONE: Where is that?

THE WITNESS: Item 36, total project cost, instead of being 2.332 should be 7.332.

BY MR. PHELAN:

Q On A-4, we talked earlier about the dredging of the North Ditch/parking lot in the specific areas, the Crescent and the Oval. Is that to be dredged in the same manner and in the same way or method as we discussed earlier?

A No.

Q What is different about the method, what we

are talking about here under A-4 and what we talked about earlier?

A Under this approach, we would be moving a far greater material from the Crescent Ditch, the Lagoon and the parking lot. The amount of material is so much greater, we thought it would be more efficient to use dredging techniques with a mudcat dredge to move it.

Q How would you expect to move it from that area to the containment cells which would be built presumably on the vacant property?

A The containment cells will be built on the parking lot.

Q I say how would you move it from the Uplands area as you call it to the parking lot?

A Well, the parking lot is part of the Uplands area.

Q I am sorry. I thought you meant some of the vacant -- let me back up.

I guess my question, if I can go back and this is in reverse of what I was saying before; how would you take the materials in the Slip 3 and transport them into the parking lot?

A It would be through a pipeline.

Q Return water pumping; return water treatment; return water pumping to Harbor. Where is the pipeline shown in Item 37?

A It is part of the dredging cost.

Q How much of that 48,000 cubic yards is from the Slip 3?

A Pretty much the same numbers as before. I would just take a minute and I will refer back to it. I would say 10,875 cubic yards.

Q From Slip 3?

A Yes, and then 500 cubic yards -- no, then the rest comes from the Upper Harbor.

Q 38,000 is the 99 percent?

A Well, it is a touch less than 38.

Q If I can just skip a moment now to B-4, that is reinforce existing sheet pile wall. Is that for the Slip itself?

A Yes.

Q There is nothing really new about B-4 except for the pipe which is included in the dredging figure of 480,000 which would pipe it over to the parking lot?

A Actually is not even new because we had a pipe and we were going to dredge in some of the earlier ones.

Q Where would you arrange for that pipe to travel from the Harbor and the Slip to the parking lot?

A We haven't picked a routing. That would be a design detail, but roughly from the Upper Harbor wherever there is the easiest access between buildings and then over to this area here (indicating).

Q The parking lot area that you are referring to runs from the Oval Lagoon directly east and along the north side of the Old Die Cast area over into the new Die Cast complex?

A Yes.

Q Let us talk about that area then.

In terms of your new plant, why don't you describe for us generally, A-4.

MR. HYNES: I think he already did.

MR. PHELAN: Well, it is true that he described it very generally.

MR. HYNES: That was your question, how would you describe it?

MR. PHELAN: I know. It is stated here in some detail and I can go through it line by line.

BY MR. PHELAN:

Q What is the reason for three containment cells?

A Just for ease of operation; that if you are

putting dredged material into a containment area, we have to build the water level up and we would much rather build the water level up over a smaller surface area so we would have less volatilization at any one time so we have a smaller area to deal with and allow one area to be full before the other areas.

The whole operation would run smoother with more than one cell. Three seem to be convenient.

Q Is 10 acres sufficient for three cells of this size?

A I believe so.

Q Including the water treatment plant as well?

A Yes, but it would take the parking lot temporarily.

Q This solution which is 11,700,000 does not include any figure for the parking lot.

A Well, we would put the parking lot back on top when we are finished.

Q 7 feet higher than it was?

A Approximately, with a good view of the Lake.

Q What is the material of which these containment cells will be made?

A The bottoms will be clay and the area will be surrounded by slurry wall which will be made out of

bentonite material and intermediate berms would be sand which would be some of the cleaner material excavated during the construction of the containment cells.

Q What is important or unimportant about this particular remediation option, in your opinion?

A It contains more of the PCB materials which we believe to exist in the North Ditch area than any of the other options discussed to this point.

It also gets 99 or strives to get 99 percent of the PCBs, thereabouts, that are in the Harbor and successfully contain them.

Q What is your preference for Alternative A-4 and B-4?

A Well, it is feasible and I think in the sense it gets more PCBs than any of the others, it has to be given due consideration. As I indicated before, we looked at the health and socio-economic impacts to a certain extent, giving more emphasis on the socio-economics, but somebody has to fold all these different inputs in to see how far one should go in remediating this particular situation.

Q Is this ever-so-slightly preferred, slightly preferred, preferred or unpreferred?

A It's not unpreferred. I would say that is one of the preferred options. All of these that I have listed here, I think are feasible and since they are feasible, I think there is a preference for them.

Q Do you prefer this one over A-3 encapsulation?

MR. HYNES: You are talking about A-3a/B-2a alternatives?

BY THE WITNESS:

A I think they both have pluses and they both have minuses. This contains more PCBs but costs more.

I believe I indicated earlier what my preference was, my slight preference and my ever-so-slight preference during this period of time before you fold in all of the health and socio-economic factors that you could bring to bear.

BY MR. PHELAN:

Q This one is not an ever-so-slight preference?

A Not at this time, no, based on what I know.

Q Why is not an ever-so-slightly preferred option?

A While it has all the positives associated with it that I described a minute ago, it has volatilization, slightly more than some of the other options that we talked about to this point.

It will require disruption of the parking lot for more of an impact upon OMC and its employees. Those are two negatives that come to mind that are somewhat more negative than some of the earlier options.

Q What would be the amount of volatilization you would expect here?

A Well, it could be over a hundred pounds between A-4 and B-4. When it gets up to that level, then we have to consider a little more about mitigating measures such as putting plastic over the partially filled sites, things of that nature. These are another thing that might come out of the contingencies.

The volatilization numbers are very, very rough figures. That is one of the reasons I want the air monitoring, so we can see what happens during construction and make some adjustments as necessary.

Q I think we got that straight away.

Do you have any problem locating the containment cells below the level of the existing parking lot?

A What do you mean problem?

Q Well, groundwater?

A Yes. Well, the site will have to be

dewatered during construction.

Q What about groundwater coming in or going out during its tenure?

A I am not concerned about that, particularly. There shouldn't be much of a difference in head between inside and outside and we will have clay on the bottom and the slurry wall around the sides, so that the movement of water is going to be very, very slow in any of the phases.

I would expect we would have lower losses to groundwater than we have right now thus far. They would be low. I am not sure I have precise calculations as to what they are.

Q These efforts that you would take to prevent groundwater from matriculating into the treatment lagoon, you think those are reasonably secure?

A I am sorry, the treatment lagoon?

MR. HYNES: You said -- you mean containment cell?

MR. PHELAN: No, you called it treatment lagoon in your Paragraph 5, Item 33, Page 33:

"In order to control groundwater during construction, a slurry wall will be installed around the 4,000-foot perimeter of the treatment lagoon and cell areas."

THE WITNESS: Yes.

BY MR. PHELAN:

Q Are you concerned, are you reasonably assured as an environmental engineer, that what you propose be done here will prevent groundwater from being allegedly contaminated by the treatment lagoon?

A I would expect to have the same degree of protection that we have on the other options or very close to it. It will not prevent all contact, but it will make it a very, very small number.

Q All of these remediation options are simply designed, do you agree?

A They are preliminary designs.

Q These designs and alternatives that you have written here are simply sketches in the mind of an architect to an architect who has to design a building, aren't they?

A I would say they are beyond that.

Q For example, here in your so-called treatment lagoon, 4,000-foot perimeter, you weren't sure where you would locate or where you would put it in the 10-acre parking lot?

A You said that. I didn't say that.

Q That's true, isn't it?

A That is a sketch. You have a sketch as to where it is located.

Q As you are sitting here right now, would you do this job for $11,700,000?

A I am not a contractor, as I explained earlier, and you need detailed plans and specifications to do it. If you asked me as you asked me before, is this a reasonable cost for a preliminary estimate, I would say yes.

Q Are these containment cells in any substantial way different from the containment cell on the present vacant lot as contemplated in early remediation options?

A Well, the major difference is they are below grade, but most everything else is pretty similar. They have 5 feet of clay on the bottom, whereas I think before we had 4 foot of clay and 1 foot of gravel, so there is a little more clay on the bottom.

We have the slurry wall around which is pretty much as we did on the other sites, but here we don't have -- let me just check.

I think maybe the amount of clay we have on the side slopes may be different, but it is a different situation because we don't have the same kinds of net head driving the material out that we did with

the above-grade site.

Q You note here on Page 34 on top of the page that the sampling data indicates that the soils in this area are relatively free of PCBs.

Does that say anything to you about the migration of PCBs in this area?

A You mean for the two containment cells built to the east?

Q Yes.

A The two containment cells built adjacent to the water treatment plant, no.

Q As you mentioned here on Page 34, you state that after the Ditch is excavated, construction of the third cell will begin. Much of the existing ground in the area to be occupied by the third cell has been contaminated by PCBs. Therefore, materials removed during excavation of the third cell will be stockpiled, temporarily, in the partially filled second cell. Once the third cell is complete, this material will be transferred to it.

Do you perceive any danger beyond volatilization in the movement, removement and subsequent transfer of this material that you allege is contaminated?

A Read the question, please.

(Question read.)

BY THE WITNESS:

A I don't see any dangers beyond the ones listed.

BY MR. PHELAN:

Q And you think under this scenario, Option A-4 and B-4, you would have a volatilization of somewhere around 100 pounds?

A Or more.

Q What would be the upper limit?

A It wouldn't be much above that. If it were to get too high, we would try and mitigate it, but it could be 150.

Q 743 days to complete this.

What would you estimate in terms of actual years that it would take since I assume these are not 743 consecutive days?

A Oh, I think that two or two and a half years would be fine.

Q That may be fine for you.

Do you think that the cost of these containment cells is competitive with just in cost, physical removal and off-site storage of these materials,

setting aside all of the other possible dangers, just cost-wise?

A I think it can be, but let me see, let me refresh myself.

Q Your costs are $6 million, more or less, for the -- I will ask you about that in a minute, but $5.9 million to build three cells.

MR. HYNES: Let me get this question straight in my own mind. Are you asking if A-4/B-4 options, the cost of that option or both of the two options together, is that cost competitive with removing the quantity contemplated in these two remedial actions with total off-site removal of the same quantity?

MR. PHELAN: Yes.

MR. HYNES: Just in the cost?

MR. PHELAN: That is the dredging in 99 percent of the Harbor and the 50 parts per million in the Ditch and then the building of three cells which you estimate to be at a cost of $6 million.

BY MR. PHELAN:

Q Is that cost competitive with off-site transport, off-site location?

A Off-site location?

Q Six million bucks?

A Well, let me try this. Perhaps if you compare A-4 and B-4, some of those with the sum of those with A-5 and B-5 which is, I believe, an off-site option that we estimated, you will find the prices are comparable except that A-5/B-5 which is off-site disposal and containment is some 10 or 20 percent higher cost.

So I would say it is competitive, but in our estimation, is less. There have been some estimates on off-site disposal that are higher than ours, too.

Q That answers my question.

Do you feel at this time you have knowledge enough of all of the utilities within the proposed cell area that you can make a reasonable estimate as to the cost of relocation?

A We think we have a reasonable enough understanding of what should be there, so we can make an estimate which is reasonably close, but it most likely has more variance associated with it than the overall project does.

Q In the second to the last paragraph on Page 33, you state contaminated materials excavated during utility work will be stockpiled and covered to prevent volatilization of PCBs.

Where would you stockpile these contaminated materials?

A This is a small quantity that we talked about before, 2,000 yards.

Q Is this between Cell 2 and Cell 3, the construction where you would move the material near Cell 2 to put them in Cell 3 after Cell 3 has been constructed?

A Wait, wait -- I see. Let me back up.

One of the early tasks that we would do under this combination of A-4/B-4 would be to construct a storm drain that we discussed before.

During the construction of the storm drain, we would have several thousand cubic yards of material that would be excavated and would be net and we would have to dispose of in some fashion. If it is clean, we have no problem. If it is contaminated, we envision covering it.

The same would hold true for any other pipes, for materials that have to be excavated in the cell area during that phase of the project. It would be a small yardage and I don't envision it would be a problem to stockpile it someplace.

Q I am a little confused though. If you look at that paragraph, are those the materials you are

talking about when you say contaminated materials excavated during utility work, that is what you are talking about?

A I believe yes.

Q Then you say the slurry wall will be built and a water treatment system, consisting of a flocculation basin and settling pond will be constructed.

Maybe you can explain what a flocculation basin is?

A A flocculation basin is a small volume where you would try and promote the growth of soil particles, individual soil particles into larger particles by adding polymers and by adding mixing power. This presumes you had been pumping a liquid containing some sort of sediment through the volume.

We have talked about similar things earlier. It would be at the front end of the water treatment plant and that is where the chemicals would be added, the flocculation basin.

Q Do you feel the estimate of 10 acres of parking lot and the location of three cells to handle the 23,00 cubic yards are all reasonable estimates?

A Yes.

Q The groundwater table here is going to be

lowered about 12 feet, is that right?

A Yes, roughly. I am not exactly sure where it is right now, but --

Q How will you make certain that that groundwater level never goes above that 12 feet?

A During the construction period?

Q Yes.

A Using a well point system.

Q Do you think there is any serious likelihood of danger from groundwater matriculating through the cells during the life of these containment cells?

A No.

Q We talked about the dredging here in Alternatives 2 and 3 and especially 3 with respect to clamshell and mudcat dredging in these areas, the three specific areas in the parking lot and Oval Lagoon and in the Crescent Ditch area, do you expect that dredging to 50 parts per million in that area is going to result in any unforeseen serious difficulties in physically moving the material out of these specific areas, the Lagoon, the Crescent Ditch and the three separate areas in the parking lot?

A I don't think there will be any unforeseen ones, no.

Q Is this dredging to be in the same manner as the dredging you talked about earlier and the three remedies where we were going to do dredging in the North Ditch area?

A No.

Q This is different?

A Yes.

Q In what way is it different?

A We are not using a mudcat in A-3. You indicated before that we were and we are not.

Q Right.

A So the difference is that we will be, here.

Q What dredging alternatives did you anticipate in the other alternatives where you weren't dredging in the North Ditch area?

A The other, you mean like A-3?

Q Yes.

A In A-3, we were going to use a clamshell and front end loaders.

Even I am beginning to remember.

Q I'm just asking if there is any appreciable danger associated with that.

A With what?

Q With using a mudcat assisted by a clamshell?

A Repeat it, please.

Q Is there any degree of danger increased by use of a mudcat than by simply using a front end loader?

A I don't think there is any overall degree of danger difference, but you are using more material, so you have more volatilization, so on a per unit basis, there is no change, but since you are moving more, then perhaps there is a difference.

Q What percentage of the 400,000 pounds you estimate in your Upland area will you be removing by using Alternative A-4?

A We would hope to get over 90 percent.

Q 360,000 pounds?

A Roughly. I have to double check the 400,000 number again.

Q The 5 feet of clay you are going to use in the Upland area, I think, is one foot more than the vacant lot area. Is that more or less than required by the regulations for containment cells?

A I believe it is a foot more.

Q In your opinion, does the reduction in the number of PCBs from the 100,000 to the 40,000 left remaining in the North Ditch area justify the cost in

A-4?

A As I indicated before --

Q Let me withdraw that.

You said before that the other remedy would take out about 300 of the 400,000?

A I said about 75 percent.

Q You did. Does in your opinion, this additional 60,000 pounds being taken out justify the expenditure of almost twice as much money?

A Well, it certainly is feasible as we have discussed, at least it is in my opinion, and there are certain advantages in doing it which we have also discussed. The overall conclusion as to whether it is the most judicious thing to do really requires the total input of people in the health field and John Henningson's assessment of the socio-economic impact and everything else, so I really don't have an answer to that question.

Q How would you propose that question be answered?

A I think the Judge has to listen to all the things that are involved and weigh what has been said and then what should be done.

Q You as an environmental engineer do not think

you are capable or competent to decide whether an extra 60,000 pounds of PCBs removed from the Upland justifies an additional $60,000?

A I am not privy to all of the information that has been developed in this particular case. I have been privy to enough so that I can develop my options and present feasible alternatives on how to remediate particular situations. That was not my mission as you described the question. If I were given all the information and it were my charge, then I could make a conclusion, but still it requires a lot of input on the health and socio-economics of it.

Q Does Mr. Henningson have enough information on the health and socio-economic side to make an evaluation?

A I'm sure Mr. Henningson can help make the judgment a little better than I can. Whether he has all of it, I don't suspect he has all of the health information.

Q Who does?

A I don't know who the U.S. Attorney has as their health experts.

Q Nor do we. Nor do they.

A Tsk, tsk.

Q They are struggling to find somebody.

MR. FEATHERSTONE: I think we have some good testimony about the absence of harm.

(Discussion off the record.)

BY MR. PHELAN:

Q What is the likely time frame for this project?

MR. HYNES: This project, A-4/B-4, right?

MR. PHELAN: Yes.

BY THE WITNESS:

A This one is rather long.

BY MR. PHELAN:

Q 743 days translates into three years or more?

A No, it translates into two, two and a half years.

Q 743 is --

A In my year there are 365 days.

Q I understand that, but you are not going to be able to do a project like this on consecutive days, are you?

A If you start at the right time, I believe you can, yes. That is why we laid it out for that. If you don't start at the right time, you would have to add a half a year to it.

Q I would be almost willing to put up a lot of

money you would never be able to finish this in three years.

A So would I. I would be more than happy to put up a quarter.

Q It is worth a lot more.

MR. HYNES: He is just not a betting man.

THE WITNESS: I am a conservative engineer.

MR. PHELAN: I propose we ask a few more questions about A-4 and B-4 and adjourn for the day and then tomorrow morning, we will pick up A-5, B-5 and B-6 and we will let Mr. Featherstone have at it.

THE WITNESS: I am curious from a logistical point of view at this point in time, what you think this deposition will take.

MR. PHELAN: That is what I am saying, I think we can finish by tomorrow morning.

MR. HYNES: By lunch, you mean, Dick?

MR. PHELAN: Yes, I think so, and then he would have the rest of the afternoon. I cannot speak for Bruce.

THE WITNESS: Would that be adequate perchance, not to hold you to it?

MR. FEATHERSTONE: The afternoon? Yes, I am reasonably certain that that is more than sufficient

time for me. In fact, if Mr. Phelan is done by lunch-time, you can probably schedule a late afternoon or early evening flight out.

BY MR. PHELAN:

Q I have a couple of questions about measurements of PCBs coming out of the Uplands area for A-4/B4.

How again would you do that, for example, out of the Oval Lagoon and Crescent Ditch? You would make sure you got that area down to 50 parts per million?

A That is the goal we would shoot for.

Q Right.

A And once again, we would be measuring the PCBs in the sediment that is being dredged and we have ideas beforehand as to where they are based on the work that has been done to this point, and during the course of the work, there would be additional samples taken in the ground to see how close we are to the 50 ppm level.

If we don't quite hit it or overdo it a little bit, then the way this option is laid out, it is still going to allow us to reach the 90 percent goal.

Q It is going to be kind of a skillful testing, isn't it, to make a value judgment as to the amount in

any one area. You cannot be sure that you have really gotten down to 50 parts per million?

A Well, you can be sure that you have moved very hot material and a lot of the material in the Crescent area is 50,000 ppm, 10,000 ppm. It's in that range of PCBs and once you get away from the hotter areas, the concentrations I would predict would drop off rather dramatically.

With that in mind, I think you don't have to be super skillful to be able to ascertain where you should stop and where you should start, but yes, skill will be required in interpreting the data.

Q And, of course, depending upon the person who is making the test and the consistency of the test, this could obviously affect the costs greatly that will be required just in cubic yards alone of movement, wouldn't it?

A I don't really think so.

MR. PHELAN: All right. We will get back tomorrow at 10:00 and I will finish up, try to finish up before tomorrow noon with the remaining remedies.

(At 4:15 o'clock p.m., the deposition adjourned, to be resumed at 10:00 o'clock a.m., September 14, 1982.)

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

THE UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	
vs.	)	No. 78 C 1004
	)	
OUTBOARD MARINE CORPORATION and MONSANTO COMPANY,	)	
	)	
	)	
Defendants.	)	

The continued deposition of RICHARD PAUL BROWNELL, called by the Defendant Outboard Marine Corporation for examination, pursuant to notice and agreement and pursuant to the Rules of Civil Procedure for the United States District Courts pertaining to the taking of depositions, taken before Thea L. Urban, a Notary Public in and for the County of Cook, State of Illinois, and a Certified Shorthand Reporter of said State, at the office of the United States Attorney, 219 South Dearborn Street, Room 1486, Chicago, Illinois 60604, on the 14th day of September, A.D. 1982, commencing at 10:00 o'clock a.m.

PRESENT:

MR. JAMES T. HYNES,
(Deputy Chief, Civil Division
United States Attorney's Office
219 South Dearborn Street
Chicago, Illinois 60604),

appeared on behalf of the
United States of America;

PRESENT: (Continued)

MR. RICHARD J. PHELAN,
(Phelan, Pope & John, Ltd.
180 North Wacker Drive
Chicago, Illinois 60606),

and

MR. RICHARD J. KISSEL,
(Martin, Craig, Chester & Sonnenschein
115 South LaSalle Street
Chicago, Illinois 60603),

appeared on behalf of Outboard Marine Corporation;

MR. BRUCE A. FEATHERSTONE,
(Kirkland & Ellis
200 East Randolph Drive
Chicago, Illinois 60601),

appeared on behalf of Monsanto Company;

MS. BARBARA CHASNOFF,
(Environmental Control Division, Northern Region
Office of the Attorney General of Illinois
188 West Randolph Street
Chicago, Illinois 60601),

appeared on behalf of the Illinois Environmental Protection Agency.

- - -

PRESENT: (Continued)

MR. RICHARD J. PHELAN,
(Phelan, Pope & John, Ltd.
180 North Wacker Drive
Chicago, Illinois 60606),

and

MR. RICHARD J. KISSEL,
(Martin, Craig, Chester & Sonnenschein
115 South LaSalle Street
Chicago, Illinois 60603),

appeared on behalf of Outboard Marine Corporation;

MR. BRUCE A. FEATHERSTONE,
(Kirkland & Ellis
200 East Randolph Drive
Chicago, Illinois 60601),

appeared on behalf of Monsanto Company;

MS. BARBARA CHASNOFF,
(Environmental Control Division, Northern Region
Office of the Attorney General of Illinois
188 West Randolph Street
Chicago, Illinois 60601),

appeared on behalf of the Illinois Environmental Protection Agency.

- - -

RICHARD P. BROWNELL,

called as a witness herein, having been previously duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION (Resumed)

BY MR. PHELAN:

Q We talked at the end of yesterday about the tests necessary to ascertain whether you were down to 50 parts per million in the Crescent and Oval area under your Alternatives A-4 and B-4. We agreed that it would take skillful testing to make sure that you were down to those 50 parts per million.

How would you do that? Who would supervise that under your design?

A I believe that would be something that should be supplied by the owner's representative who could be the design engineer, resident engineer.

The work would be performed most likely by the contractor, let us say insofar as collecting the samples and then the analysis may or may not be part of the construction contract. That is a detail that can be worked out, but the actual supervision or inspection of taking the samples and making sure that the laboratory has proper quality control and everything, that would definitely have to be reviewed in my scenario

by the resident engineer, who would be in essence, the owner's representative.

Q In all of these remediation options that you have proposed in your Exhibit 3, was it your thought that the owner would do this work?

A Sorry, would do what work?

Q The work you propose under your remediation options.

A Perhaps I am using the owner's representative too loosely. That is usually the person who is let the contract. I consider it to be equivalent to the owner.

Q Who in contemplation of these remediation options did you think was going to be letting the contract?

A I have not thought about that, whoever has the money.

Q Does it make any difference to your remediation options, who the owner's representative is, as you call it?

A The owner's representative?

MR. HYNES: Are you talking about this resident engineer?

MR. PHELAN: I think that is what he referred to.

Let me withdraw the question and make it different.

BY MR. PHELAN:

Q In your remediation options as to who is letting the contract and thus is supervising the work?

A It makes no difference in my remediation option efforts as to who is letting the work. The supervision of the work has to be done by someone who is qualified to do it.

Q Who in your opinion would be qualified to supervise the work?

A I believe that one possibility would be the design engineer, his staff. In certain cases for parts of the work, it is possible that, let us say OMC has on board somebody who is qualified in construction techniques and may be a very useful member of a team to review the construction of certain of the remediation efforts.

I have no idea as to how exactly, who should do it and how this team should be made up, because that is usually something that is worked out during the end of the design, the detailed design. When we do projects, we try to see who are the most qualified people who are available and try to get them

assigned to the construction team.

Q Why don't you describe for us Alternative A-5 and B-5 which begins on Item 42 and 43.

A In many respects, A-5 and B-5 is similar to A-4 and B-4, at least insofar as the same quantities of materials are being removed and placed in a more secure area.

The major difference is that the secure disposal site would be off site, off site meaning not in the immediate Harbor area. To accomplish this, it will require a temporary dewatering and containment lagoon to consolidate all the material dredged and then rehandling of the material to take it out, most likely by truck, to a secure landfill which we believe can be located within 20 miles of the Harbor.

Q Have you had any experience in off site estimating, estimating off-site depository costs?

A Well, in many regards, if I understand the question, this off-site disposal area would be like the off-site disposal area we have for the Upper Hudson.

Q Do you know whether in fact an off-site secure landfill is available within 20 miles of Waukegan Harbor?

A We are talking here of establishing a new

site based on a preliminary review of the soil types within 20 miles. We believe that there are some sites which would be candidates and therefore it is technically feasible to accomplish this.

Further, we understand that there is a landfill operation in Mt. Zion which --

Q In where?

A Mt. Zion, a few miles to the north of Waukegan Harbor which is operated, I believe, by Browning, Ferris Industries. That would be another possibility insofar as there is a site there. It would probably have to be made more secure than it is now, though we did not investigate that option in detail.

Q What is the projected cost of Alternative A-5 and B-5?

A The cost has been estimated by us to be just under $14 million.

Q Just as a matter of curiosity, is it your opinion as an environmental engineer that the State of Illinois will permit off-site storage of PCBs in a proposal such as the one you have made under A-5 and B-5?

A I don't believe the State of Illinois would

have any problem with it.

Q Why?

A I see nothing in what I understand of their regulations, I see nothing in their regulations which would preclude it.

Q Have you been able to locate a 20-acre site that you could acquire for the purpose -- you said a 60-acre, a 60-acre site for your purpose within 20 miles of Waukegan?

A I specifically have not. You might talk to Mr. Henningson more about that.

I believe we only did limited work trying to identify potential sites on a very rough basis so that we could see whether this was a feasible option.

Q One of the biggest contingencies, isn't it, is the securing of landfill within 20 miles; indeed, in B-5 and A-5?

A That would be one of the major factors, yes.

Q You haven't located one?

A What do you mean by that?

Q You don't have a piece of land that could be acquired for $300,000 consisting of 60 acres within 20 miles of Waukegan Harbor?

A We believe there are such sites, but we have not placed an option on them.

Q I don't mean an option. Where are they?

A I would suggest you talk to Mr. Henningson more about it.

Q He has some specific areas that he has located that are available for purchase at around $300,000?

MR. HYNES: You are changing the question on available for purchase. You are adding --

MR. PHELAN: No, I am not. Well, God knows, I hope so. I realize this is all fantasy, but at least you ought to make the pretense.

BY MR. PHELAN:

Q Does Mr. Henningson have a 60-acre site that is available for purchase at $300,000?

A You should ask him.

Q I know, but this is your work. Does he or doesn't he?

A We believe, as I indicated before, that there are such sites and that that is a reasonable price for them.

Q There are such what sites?

A 60 acres.

Q 60 acres of land?

A I would say that is fairly accurate.

Q What makes you think besides your reading of the regulations that the State of Illinois would permit PCB storage in the State of Illinois?

A I believe we had some discussions with the people in Illinois EPA.

Q Are you basing your opinion on the fact that "we had discussions with the Illinois EPA" or are you basing it on some other information that Illinois will permit PCB storage within the State boundaries?

A We understand, as I said before, in the regulations there is nothing precluding it and from the discussions with the people of Illinois EPA, they have indicated there is nothing to preclude it either, from the State level.

Q Who are those people?

A I don't have their names with me.

Q Did you go down to talk to Illinois EPA?

A We used the telephone.

Q Did they tell you they would not object to appropriate storage of PCBs within the State boundaries of Illinois?

A We believe they did, yes.

Q Did they say yes or did they say no? You say,

"We believe they did."

A I didn't talk to them so I don't have the exact discussion in my mind.

Q In this off-site location, I notice that you have a series of nests for monitoring wells. What would you again be testing for in the off-site secure landfill?

A You are referring to what?

Q Page 48.

A As with the other options, we would be monitoring to make sure that the secure site performs as we intend it to.

Q What are you looking for in the monitoring?

A We would be looking at PCB concentrations and also the water levels in the monitoring wells.

Q Is that groundwater that you suspect would be contaminated by PCBs in a landfill?

A We wouldn't expect it to be contaminated at all, but it is just a judicious action which we would recommend in any project of this nature.

Q Is it your thinking and was it your thinking when you proposed these alternatives that the continuing monitoring systems would permit the person that was letting the contract to correct any unforeseen difficulties

any uncertainties over these proposals throughout the life of these containment cells, encapsulation or secure landfills?

MR. HYNES: You are talking about all of the different options, right?

MR. PHELAN: Yes.

THE WITNESS: You are talking about what monitoring?

BY MR. PHELAN:

Q All the monitoring that you have suggested under all these alternatives.

A There are two different types of monitoring that we have suggested throughout these options in general. There is monitoring during construction and there is also monitoring after construction is completed.

Q I am referring only to the monitoring after construction.

A Now it is obvious, yes.

Q Would you answer my question?

MR. HYNES: Would you read the question?

(Question read.)

BY MR. PHELAN:

Q Let me rephrase it.

The monitoring that you anticipate being done after construction is completed and after the

construction has met whatever standards you ultimately arrive at in the detailed drawings, this monitoring which I presume goes on infinitum, is it your thought and was it your thought when you proposed these remediation options that the person letting the contract would, in accordance with some standards yet to be drawn up, make whatever changes necessary to meet those standards as and when the monitoring showed the standards were not being met?

A Yes.

Q Your O&M cost for A-5 and B-5, do they include the costs of O&M for the off-site secure landfill?

A Yes.

Q And your construction schedule, does that anticipate, depending on the season in which you begin, some more than three years in construction?

A I would say about three years.

Q Now --

A Plus or minus a little bit.

Q In the description of the dredging of the North Ditch and the Crescent, you seem to have a different methodology there as opposed to your earlier methods of dredging the Lagoon and Crescent and parking

lot, is that true?

A I think the dredging in A-5 and B-5 is similar to A-4 and B-4, but it is not similar to some of the earlier options.

Q Let us look at Page 43.

A All right.

Q Of Exhibit 3.

A Yes.

Q "In order to excavate the Oval Lagoon and Crescent Ditch, the culvert at the north (discharge) end of the Lagoon would be plugged to contain sufficient water to float a mudcat dredge."

A Yes.

Q Is that anticipated under A-4 as well?

A The use of the mudcat dredge is, yes.

Q I understand that.

A But the actual, as to which direction we are working, I believe the direction has changed, but I believe it is the same equipment.

Q Under A-4, do you anticipate plugging up and floating the dredge and then dredging to a depth of 9 feet below its present bottom?

A Well, whenever we use the mudcat, we will have to create an area that it can float on so that it

can work, so we will have to be plugging up something, maybe not plugging it up in the same sequence as described here.

Q It is different, the way you are intending to dredge under A-5 from A-4?

A Slightly different.

Q If you look at Page 34, you say in the second to the last paragraph on that page:

"The second cell will be utilized to contain material removed from the Crescent Ditch, Oval Lagoon, East-West Ditch, and that portion of the parking area between the slurry wall and the Ditch. As in Alternative A-5 and B-5, a mudcat, assisted by a clamshell for deep excavation, will be employed to dredge these areas."

Are you saying then that A-4 and A-5 are to be exactly alike in that A-5 actually spells out what you are going to do in A-4?

A I believe you meant A-4 and B-5?

Q I said A-5 and A-4, right.

A Could you read the question again?

Q All I am asking you is under Page 34, you state that the A-4, B-4 remedy involving North Ditch area generally will be as in Alternatives A-5 and B-5,

that is a mudcat assisted by a clamshell for deep excavation will be employed to dredge these areas.

Does that mean that you will follow the procedures outlined on A-5 and B-5 on Pages 43 and 44?

A I believe it says what it means in that both alternatives or both combined options, we are using a mudcat assisted by a clamshell. They both will dredge the material out, but as I indicated before, the sequence and the direction the units would work will most likely be different. That is the way we set it up.

Q Well, I am confused. You say you are going to do it as in A-5 and B-5 and here you say A-5 and B-5, Page 43, you are going to be dredging 9 feet below present bottom at the easterly end.

A Yes, I believe that is correct.

Q Is that A-4, too?

A Let's go slowly. The sentence I believe you are keying in on, the way I understand it, is that Alternatives A-5 and B-5 and the mudcat, a piece of equipment will be employed to dredge these areas.

In that regard, the same equipment as I said before is used in both options.

Q Fine. That was my first question. Then you answered it ambiguously as you have fairly often. I then asked you whether it was going to be done in much the same way and you are telling me the words mean what they say.

Am I to conclude, Mr. Brownell, that A-5 in the manner set out there is the way it will be under A-5 and not necessarily under B-4?

A If I understand, Mr. Phelan, in A-5, we have described how we are going to do A-5 and B-5. Some of the things we described there are applicable to A-4 and B-4. For instance, what we dredge to will be approximately the same because we are dredging the same or trying to move the same volume in both cases.

As I indicated before, insofar as the direction or the sequence of dredging, that will differ.

Q Why is there a difference between A-4 and A-5?

MR. HYNES: You mean in the sequence of dredging?

MR. PHELAN: In the sequence of dredging or the depth or the manner of plugging, whatever.

MR. HYNES: He already said the depth would be approximately the same. He said the difference is going

to be the direction or the sequence of dredging that is going to be done.

BY MR. PHELAN:

Q Are you going to dredge to below 9 feet below its present bottom?

A Yes.

Q In A-4 and A-5?

A Approximately, but in one option, A-4, we may go a little deeper because we want to put 5 feet of clay on the bottom, so within a foot or two, it will probably be the same, very close, I would say.

We are still trying to contain the same amount of material in both combined options.

Q How much of the PCBs in the North Ditch area generally do you expect to recover under A-5?

A We hope to get about 90 percent.

Q Is that less than A-4?

A No, that, I believe, is the same as A-4.

Q But you are expecting to get 360,000 pounds?

A Yes.

Q The trucking of the material to the off-site disposal area, how do you estimate that?

MR. HYNES: You are referring to a particular item in the cost estimate?

BY MR. PHELAN:

Q Somewhere you provided for transportation of material.

A Yes.

Q Where did you provide that?

A Page 47.

Q You note on Page 47 that you have 48,000 cubic yards at $15 a unit cost for a total of $720,000?

A That is for the Harbor.

Q Right, A-4 or A-5, your 73,800 cubic yards at $15 unit cost a cubic yard, is that right?

A Excuse me?

Q Item 46.

A Page 46?

Q Yes.

A Yes.

Q How did you arrive at the $15?

A That cost represents the cost of excavating the material from the temporary lagoon and containment sites and trucking it to a site that we estimated for the purpose of this calculation to be about 20 miles away. I believe we used large semi-type vehicles capable of handling, say, 16 or 17 cubic yards per vehicle.

We then made a calculation as to the cost for moving the material that far. If I recollect correctly, it is somewhere around 30 cents a cubic yard per mile in a one-way haul.

Q 30 cents per cubic yard?

A Per mile, just using the loaded direction. Mr. Mulligan could get you details on that.

Q $6 per 20-mile trip, one way?

A Yes, and that accounts for bringing the trucks back.

Q We are putting 16, 17 cubic yards, we are talking about $125 one way, 17 cubic yards at a rate of 30 cents per cubic yard per mile?

A I believe that is correct. As I indicated, I believe Mr. Mulligan could give you some more details on that.

Q What do you assume will be the volatilization under your Alternatives A-5 and B-5?

A It will be fairly similar to A-4 and B-4. I would expect it would be somewhat higher. We will be taking actions to mitigate the volatilization.

Q What did you begin to suggest it would be under A-4?

A I believe I said over a hundred, perhaps as

much as 150 pounds.

Q Did you estimate for me, I think at an earlier deposition, the amount of truckloads that would be required being removed from Waukegan Harbor and towed out to the landfill?

A I believe I estimated how many truckloads it would take for the quantity of some material to be hauled under one of the other earlier options, yes.

Q You are going to tow it out at about 123,000 cubic yards? Give me some idea how many one-way trips one-way units would carry that cubic yardage. What is it going to involve?

A A very high number, approximately 7,000 truckloads or more.

Q Incidentally, when did you speak with Illinois or your office spoke with Illinois EPA?

A Several weeks ago, I think.

Q Do you know whether you would need a permit from the Department of Transportation of the State of Illinois and Lake County and City of Waukegan to transport 7,000 truckloads?

MR. HYNES: He said approximately seven.

MR. PHELAN: 7,000, right, one way; 14,000, two ways, same road.

BY THE WITNESS:

A I believe if the site is within Lake County, then Lake County will have to have hearings and determine whether they want the site, I believe under the Senate Bill under Local Senate Bill under State Legislature that they have that right subject to review by the State.

I believe that permits will be required for transportation, but I don't really know who authorizes them.

BY MR. PHELAN:

Q You don't know in fact if they would give you the permits?

A We have not pursued that.

Q But you, I assume from the fact this is an option,that you think the permits will not be unreasonably withheld?

A At the State level, we don't believe they will be unreasonably withheld. I would expect there will be a considerable effort required to convince Lake County that a site should be put within their confines.

Q I think you'd have just as much trouble convincing them they ought to have their roads used by these truckloads to the tune of 7,000 one-way runs

for three years.

Incidentally, will Mr. Henningson factor in those things and the socio-economic factors in these remedies?

A I believe he will. We all try to do that. That is certainly a factor worth considering in this project.

Q What do you suppose the risk is of dumping PCBs someplace in Lake County or wherever by running a truck 7,000 times?

A I would say there is risk that has to be thought about in the sense that it is not going to be wet material and if there is an accident, it should be able to be cleaned up.

Q In all of your remediation options, did you determine whether, and in particular the off-site containment system in A-5 and B-5, whether that would comply with the Resource Conservation and Recovery Act?

A I don't believe that the Resource Conservation and Recovery Act has anything to do with PCBs because PCBs are not a hazardous waste.

Q How about TOSCA?

A Yes, we believe that the off-site disposal area will comply with TOSCA. We believe that it will

comply more readily, more readily with TOSCA than any of the other options.

Q What about the encapsulation and on-site disposal that you opined are remediation options?

(Brief interruption - phone call.)

BY MR. PHELAN:

Q You were going to answer whether the other remediation options including encapsulation and on-site disposal met the requirements of TOSCA.

A The option where we build a secure site above grade, I believe can be made, I believe has been made to meet TOSCA.

There will be some discussions I am sure as to how close it is to groundwater, but I believe with the double liner system we have, it is in total compliance.

Q You don't think the Resource Conservation and Recovery Act requires or makes obligatory any systems for the containment of PCBs?

A It is my opinion.

Q I asked you whether in the encapsulation, you met the requirements of TOSCA as you opined it should be done under your remediation options.

A Well, they are all encapsulation. The above-

grade landfills are totally okay. The two or the options where we dispose of material below grade in the parking lot, we will have to go after an exemption from the groundwater for that and the option of putting it in Slip 3 and encapsulating it there, that is going to require a little bit more imagination. I am not sure that TOSCA really applies in that. Perhaps CERCLA does.

MR. KISSEL: Superfund.

BY THE WITNESS:

A (Continuing.) And that in a way, if we just were to encapsulate the material that is there now, I am sure that Superfund will be totally applicable. Whereas, if we move material in, then that may be cause for concern at the regulatory levels and we will need more exemptions.

That is also a factor in the options tnat we propose, the lower cost ones will require more work to get the regulatory approvals.

BY MR. PHELAN:

Q Are you saying in effect that it is your opinion based upon these remediation options that approval will be given under TOSCA for the encapsulation in Slip 3 as proposed under A-3b and B-2a and so on?

A I think they are perfectly reasonable and I think they should be given. Until you get all the permits, you don't know for sure.

Q What are the chances they will not be approved, within your opinion?

A I have no opinion as to the percentage odds.

Q Would you admit there is some chance they may not be approved?

A The encapsulation of Slip 3, there is a chance.

Q To your knowledge, has TOSCA ever approved an encapsulation scheme similar to the one that you propose under A-3b and B-2a?

A Encapsulation of Slip 3?

Q Yes.

MR. HYNES: Are you asking if TOSCA has ever given approval of any similar project and just talking about the encapsulation of Slip 3?

MR. PHELAN: The encapsulation of Slip 3.

BY THE WITNESS:

A To the best of my knowledge, no. However, we have stabilized bank deposits in the Upper Hudson and have left them in place. That is similar enough in that it would be impressive at least to argue that

the materials that are in Slip 3 can be left in Slip 3 and properly stabilized without moving them. So it is water close to sediment, but it is not water over sediment, if you will.

BY MR. PHELAN:

Q You have one final option remaining, Alternative B-6. Could you describe that for us?

A Alternate B-6 consists of dredging Slip 3 in approximately 500 cubic yards of material from the Upper B-1 Section of the Upper Harbor and then securing it in an above-grade landfill, located on OMC's vacant lot.

This option consists of the smallest dredging activity and would contain fewer PCBs than any of the other options.

Q You state that this alternative is the same as B-3a except that the containment site would only be used for the material from the Slip and the Upper Harbor, and no capacity would be provided for material from the North Ditch or the parking lot. Is that your recollection?

A Yes, that is my recollection. This is only a B-type option which addresses the Harbor. You would have to have another option go along with it to address

remediation in the Uplands North Ditch area.

My thought was that the options such as A-2, the option such as A-2 would go with B-6.

Q Now that we have gone through all of the options again, would you again state your preference or lack of preference for any of these options?

MR. HYNES: It's been asked and answered several times.

MR. PHELAN: I thought maybe he changed his mind.

BY THE WITNESS:

A I still really have the same feeling as before. I feel that all of these options are feasible and I have a preference for the options where we are taking the material in Slip 3 and successfully containing it and also taking some positive action in the North Ditch to stabilize that material to a better degree.

My ever-so-slight preference is to remove the really hot material from the North Ditch Uplands area, the 10,000 cubic yards, and secure it in Slip 3, but there are socio-economic and health, other aspects, regulatory issues which have to be all folded in before a final recommendation can be, I guess, made by the U.S. Attorney to the Judge.

BY MR. PHELAN:

Q Mr. Brownell, supposing we have encapsulated Slip 3 as you have suggested in a number of your options, dredged nothing in the Harbor and stabilized the North Ditch Crescent area without removing any of the PCBs.

In your opinion, would that remedy, as you have just described it, meet those criteria that you have set forth in these remediation options that are contained in Exhibit 3?

A I believe what you just said parallels closely B-6 and A-2 with the exception of the 500 cubic yards in the Upper B-1 area that I feel should be dredged. As such, with the 500 cubic yards, it certainly would be a feasible option.

MR. PHELAN: Why don't we take a break for a minute.

(Brief recess had.)

BY MR. PHELAN:

Q If I recollect my question dealt with no dredging at all in my option which is not similar to the options that you mentioned when you just now answered my question. So let me restate it again.

In your opinion as an environmental engineer, would encapsulation of Slip 3 with no dredging of the Harbor and no dredging of the Upland area at all,

parking lot, Crescent Ditch, Oval Lagoon and/or the East-West Ditch, with simply a stabilization of that general area meet in your opinion that criteria that you used in deciding on these remediation options which are set forth in Exhibit No. 3?

A Not entirely, no.

Q What other added work would you add to my --

A To make it feasible by my criteria, some action would have to be taken relative to the silted-in areas in the upper part of the section of the Harbor called B-1 in the Mason and Hanger report.

Dredging would be one possibility to remove the siltation. Another possibility would be to provide equivalent dock space in the immediate area by creating new bulkheading or new area that isn't silted over.

Q Do you know, by the way, who it was that called the Illinois EPA Agency to determine whether an off-site secure disposal site could be located in Lake County and Illinois?

A I believe the question we had posed to Illinois EPA was of a general nature as to how you would go about siting a facility based on our understanding of the regulations and the gentleman who proposed the general

question was Ronald Mills who is on Mr. Henningson's staff.

Q So Mr. Henningson presumably will be able to tell us the details of that conversation?

A I am sure he can make that a point.

MR. PHELAN: I at this time have no further questions. I may have a couple of others after Mr. Featherstone is completed.

CROSS EXAMINATION

BY MR. FEATHERSTONE:

Q Mr. Brownell, you testified that your instruction from the U.S. Attorney's Office was to look at all feasible options, is that correct?

A Yes.

Q In doing that, did you review the Mason and Hanger proposal; in other words, their dredging proposal as to how they do it, how much they would remove, where? Had they instructed you to do that kind of thing?

A I have read most of the Mason and Hanger reports. I am not sure that I had access to all of their costs and/or all of their recommended options.

Q Did you review materials that described the dredging program for the Harbor that Mason and Hanger had proposed?

A I believe I looked at some information they had on dredging.

Q As one of the alternatives that you considered but did not set forth in Exhibit 3, did you consider a program on the scale of the Mason and Hanger program?

A They had considered many programs. I don't know what you are referring to, which one.

Q The one that they have recommended for adoption; in other words, dredging sediments down to 50 parts per million concentration PCBs using these liners in the Harbor to prevent movement of material, that type of thing, for ultimate disposal off site, but not within 20 miles of the Harbor.

MR. HYNES: You are talking about their option of dredging roughly most of the Harbor down to that level using a silt screen to protect against movement during the dredging operation?

MR. FEATHERSTONE: That is correct.

BY THE WITNESS:

A I believe that is what he asked, but we thought about the silt curtains but since they seem to be controversial and we don't have any direct experience with them, we did not recommend them in any

of our dredging options.

We did consider an option to dredge to approximately 50 ppm and that is contained in my, whatever it is called, No. 3.

BY MR. FEATHERSTONE:

Q Exhibit 3.

A Thank you.

Q Did you have any criticisms of the Mason and Hanger dredging proposal?

A None that I can think of, that particular one.

Q Did the U.S. Attorney's Office ask you to review the Mason and Hanger proposal and make comments on it?

A No.

Q Do you consider the alternatives that you proposed in Exhibit 3 to be as beneficial for Waukegan Harbor and the North Ditch as was the Mason and Hanger proposal?

A I haven't made that comparison.

Q Could you do it?

A Not right now. I have not compared my options against theirs.

Q Did anyone at Malcolm Purnie make those comparisons?

A I don't believe so.

Q Do you see any need for the Mason and Hanger proposal?

A Which proposal again, just so we are clear here? The 50 ppm?

Q To my knowledge, they only have one proposal for Waukegan Harbor and that is to dredge all the sediments with PCB concentration in excess of 50 parts per million using silt curtains, using certain types of hydraulic equipment and then disposal somewhere off site.

Cost projections have run anywhere upwards of $40 million.

A Well, let's talk about one thing at a time, perhaps make it easier for me.

We have considered an option which dredges to 50 ppm and utilizes off-site disposal. I consider that to be a feasible option. I feel that regulatory-wise, it will meet all the criteria, all the technical criteria that would be applied to it.

Q I don't mean to interrupt you, but my question is specifically to the Mason and Hanger proposal as written, drafted and presented by Mason and Hanger.

A Right.

Q And which you have reviewed to some extent or other.

MR. HYNES: Bruce, let me cut this short and maybe make it a little bit easier.

I don't think that they ever received from the Mason and Hanger report, the section in their report that had the specific recommendation from Mason and Hanger as to what they felt is the most appropriate option, being dredging the Harbor down to 50 ppm. I don't think that section of the report was ever given to Malcolm Purnie.

BY MR. FEATHERSTONE:

Q Did you receive that section of the report, Mr. Brownell?

A No, I don't believe so.

MR. FEATHERSTONE: Mr. Hynes, why wasn't it submitted to them?

MR. HYNES: Because it was our decision not to give them that section of the report. And one thing further, as far as I recollect the only portion of the Mason and Hanger's work that they were not given was just the recommended solution that you were just talking about. That section was not given to Malcolm Purnie.

BY MR. FEATHERSTONE:

Q Mr. Brownell, did you ever consider off-site disposal of dredging materials from the Harbor or the North Ditch for off-site disposal further than 20 miles from the site?

A Yes.

Q You did not present that in Exhibit 3, however?

A No, I believe I discussed that in one of the earlier days of deposition as to what other ideas we discussed but did not consider appropriate.

Q Is it your testimony that you and others at Malcolm Purnie did not consider appropriate, off-site disposal that did not involve trucking more than 20 miles from the Waukegan area?

A No, I wouldn't say that was what we decided. Your original question asked did we consider things that were beyond 20 miles, and the answer was yes.

Q But you decided not to present it to the U.S. Attorney's Office as an alternative?

A The things we looked at involved largely barging material from the State of New York which is a very far distance and that answers your question. And because of the vast disparity in the distance, we did not consider that further as I discussed earlier.

We did not, however, look at 25 miles or 21 miles or something of that nature.

Q Did you or anyone else at Malcolm Purnie consider off-site disposal that is farther than 20 miles other than what you just referred to?

A I don't believe we did, but it is certainly something worth thinking about. I would not preclude it.

Q Mason and Hanger recommended disposal down in Cincinnati. Did you look down in Cincinnati?

A No, I don't believe we considered taking it to Cincinnati, but the distance is almost the same to Cincinnati as it is to the New York-Buffalo area.

Q And to your judgment, that is just too far to make it economically feasible?

A Curiously, the economics perhaps are not that far out of the picture in my mind, but I am concerned about trucking, for instance, this vast amount of material that far.

I think that the more truck miles that you have, the risk of accident increases. The risk is the same, but the likelihood of an accident event occurring becomes more possible and therefore is something we have to consider more.

Barging was also considered and again, the costs didn't seem to be totally prohibitive to me.

Q Was it just distance or was it distance and money that caused you to rule out Buffalo as a disposal site?

A It was method of getting it there and the distance and the costs while they were not unreasonable in my mind, we seemed to have other options that made more sense to us in the local area for approximately the same costs. So why, if you have two options that are approximately equal in cost, why go for more risky option when you have something that is less risky?

Q How far did you get in projecting the costs of movement of material from the Waukegan area to Buffalo, New York? It was Buffalo, New York?

A Buffalo area, yes. Not very far.

Q When you say not very far, would you tell me how far you got in making those cost projections? Did you ever set pencil to paper, for instance?

A We did some rough stuff, but once I decided that it didn't look like an option that I thought was feasible or I should say was as feasible as the others that we were looking at, we just discarded that information.

Q To get the material from Waukegan to Buffalo, would that require 7,000 truckloads as you described earlier?

A I would say, if you are talking about Options A-4, B-4 and Option A-5, we are talking about 7,000 truckloads if we go by truck. If we go by barge, it would be far less.

Q How many barge trips?

A I didn't calculate that.

Q Did you ever get far enough in your work considering the Buffalo, New York area to determine the costs of barge movement of the material from Waukegan to Buffalo?

A No.

Q You have given some testimony --

A I take that back. We did have a discussion, I think, with a landfill operator in the Buffalo area who gave us a rough quote on moving, say, 10,000 cubic yards of material inclusive of the barging, I think.

Q Inclusive?

A I just don't recollect.

Q Do you remember what number he gave you?

A (Nodding.)

Q You have to answer audibly.

A I am sorry, no.

Q There has been some testimony about the volatilization of PCBs. First of all, do you have any data regarding the measurements of PCBs in the ambient area in the Waukegan Harbor area today?

A What it is today? I don't know what it is today.

Q I don't mean today specifically, September 14, but do you have any data that suggests what it is at the present time: This month, last month, last year, next year, that type of thing?

MR. HYNES: I think that was asked and answered earlier, but you can answer.

MR. FEATHERSTONE: Jim, I am not trying to go over material.

MR. HYNES: No, I just made my objection. He can answer.

BY THE WITNESS:

A I recollect as I indicated earlier in the deposition that there were a few pieces of data on ambient air quality taken several years ago which was not quite your time frame. I don't recollect what they were.

BY MR. FEATHERSTONE:

Q I am sorry, you don't recollect the data?

A That is correct.

Q Are you aware of any data regarding the PCBs in ambient area in Waukegan taken anytime after that set was taken a couple of years ago?

A I am not aware of any.

Q You were asked by Mr. Phelan to make some calculations about the number of pounds of PCBs that would volatilize during certain of the remedial steps or options that you considered.

In drafting Exhibit 3, did you make any calculations while you were drafting Exhibit 3 or about that time of how many pounds of PCBs would be volatilized?

A I made some order of magnitude estimates, rough estimates.

Q Give me an example of what you mean by an order of magnitude estimate.

A Well, the whole question of estimating the volatilization losses PCBs is a little difficult. There is information that has been developed as to how to calculate the volatilization losses and it's been checked out one or two places like in the Upper Hudson when we did some of our work. But it is still a rough calculation and I am not sure that all of the

factors to make it a precise number have been developed to a point where people can make precise calculations, make rough calculations.

Q One of the rough calculations you made were that in a couple of these alternatives that you proposed that the volatilization would reach 100 to 150 pounds PCBs.

A That it might, and when it gets that high, we would start thinking about more mitigating measures.

Q How did you make that calculation?

A You have to look at the concentration of PCBs and what you expect to be in the water column, for instance, and then using some K rates and some other empirically derived factors, you consider the hypothetical loss or the loss of PCBs from the water column to the air and that is roughly what I did. I have been using a rough factor, boiled all down that if you had, say, 70 parts per billion of PCBs in the water column, that you might lose, say, 3/10ths of a pound of PCBs per acre per day of exposed agitated water surface.

Q Do the figures 100 to 150 pounds of PCB refer to volatilization of PCB only from the water column or does it include volatilization from dredged sediments as

well?

A Yes. You make some similar calculations and although they are even less precise, they give you an answer in roughly the same range. That is giving me, using that as a rough rule of thumb, an idea as to what losses may occur.

Q You were asked by Mr. Phelan to estimate the movement of PCBs from the Harbor to the Lake after certain of your remedies had been implemented. Do you remember that, and you estimated that a couple of remedies would result in a reduction of movement of PCBs from the Harbor to the Lake on the order of magnitude of one to four pounds of PCBs.

A Yes.

Q That was on an annual basis, I take it?

A Yes.

Q How did you make that calculation?

A As I indicated at that time during the deposition, that calculation or that number, I should say, relied upon a lot of work that HydroQual did in that we are taking out a lot of PCBs that the net movement from the sediments to the water column and hence, from the water column into the Lake, will be reduced.

Q Your estimate of one to four pounds of PCBs,

did you derive that by actually running the HydroQual model?

A No.

Q Had you made that calculation before this deposition?

A No, well -- except that when we looked at the remediation alternatives that we felt that it would be useful to have a remediation alternative that made a reduction in the movement of PCBs because that would be one criterion for evaluating the efficacy of an option.

Q I understand, but did anybody at Malcolm Purnie take one of your alternatives, make any assumptions about the presence or concentration of PCBs after the alternative had been implemented and then run the HydroQual model to determine what the PCB movement from the Harbor to the Lake would be after that alternative?

A With all those things put together, the answer is no.

Q You testified that after removal of sediment and water from the Harbor and treatment on the surface and disposal, water would be returned to the Harbor containing approximately 20 to 30 parts per billion PCBs.

MR. HYNES: You are talking about the return water from the water treatment facility, the lagoon?

MR. FEATHERSTONE: The lagoon.

THE WITNESS: When we used dredging?

BY MR. FEATHERSTONE:

Q Yes.

A Yes, I remember that.

Q Did you perform any calculations to determine to what extent that process would increase the movement of PCBs from the Harbor to the Lake?

A We made or I made some, again, rough calculations and quickly reached the conclusion that the major loss associated with that would be volatilization and that the sheet piling that we used to close the Harbor, while it is not watertight, should have a very, very small flow of PCBs through it during the period that it is enclosed, even if you take the entire area that is closed and assume that the concentrations 20 or 30 parts per billion PCBs and then remove the sheet piling and allow all that water to go back into the Harbor, you are going to have a relatively small amount of PCBs contained in the water column.

Q Let me see if I understand that.

The water column concentration of PCBs in the Harbor is less than one part per billion.

A At the present time. We understand that it often is less than one, although on occasion it is well above one.

Q When you say on occasion it is well above one part per billion, what is the data on that?

A OMC's data.

Q On the Harbor?

A Yes.

Q Where in the Harbor?

A Wherever they sample.

Q Do you know where that is?

A I don't recollect, but I am sure you could find out.

Q The water that you put back in the Harbor containing 20 to 30 parts per billion PCB, how long would it take that water to get back to the one part per billion or less PCB? In other words, how long would it take for that water to cleanse itself?

A I have made no calculation.

Q Do you have any idea?

A If you like, I will sit down and make a calculation when we have a break.

Q How long would that take?

A What, excuse me?

Q To make that calculation?

A Maybe 15 minutes.

Q How would you do it?

A First I would calculate the amount of PCBs that would be in the water column and then --

Q Which is 20 to 30 parts per billion, right?

A Right, but I have to calculate the volume of water and then looking at that relative to overall poundage and making a guess as to the amount of net water flow, referring to the HydroQual report, I might be able to come up with that number. If I can't find it in the HydroQual report, then I will have to wait until later to make a calculation. If it is important to you --

Q I take it because you have to break at this point and do it during a recess, you have not made that calculation, is that correct?

A That is correct.

Q The sheet piling that you referred to in one of your earlier answers that would be there which would reduce the amount of water from the northern part where you were returning the water to the southern

part of the Harbor, how long would you leave that sheet piling there after you completed the dredging?

A I would leave it in a couple of days and then take it out.

Q Why would you leave it in a couple of days?

A I would like whatever settlement is going to occur of turbid material to occur.

Q Do you have any idea how much that settlement of turbid material would reduce if at all the PCB material to the north of the sheet piling?

A Not at this time, I don't.

Q Have you made any projections about what any of the dredging remedies you propose might do to the PCB levels in the drinking water taken out of the Waukegan Harbor?

A There is no drinking water taken out of the Harbor.

Q Are you aware there is an emergency intake out of the Harbor?

A Yes, and it was used once, I believe, in the last decade.

Q Have you made any projections about what might happen to the PCB levels in the drinking water if that emergency intake had to be used during the

dredging or shortly after the dredging?

MR. HYNES: The question is has he made any calculations?

MR. FEATHERSTONE: Yes. I assume the answer to that is no, but I want to make sure.

BY THE WITNESS:

A I have thought about that and I felt that --

BY MR. FEATHERSTONE:

Q Did you make any calculations, first of all that you are aware of. That is what I would like you to answer.

A No.

Q You say you have thought about that possibility. What have you concluded or have you done enough to make any conclusions?

MR. HYNES: Your question is has he done enough to make any conclusions as to what effect it would have on the --

MR. FEATHERSTONE: I will put the question.

BY MR. FEATHERSTONE:

Q Mr. Brownell, in doing the work that you have done in preparation for your testimony in this case, have you done enough work to make any firm conclusions about what if any effect your dredging remedies

in the Harbor might have on the PCBs in any water that had to be taken in through the emergency intake during the dredging or shortly thereafter?

A We have considered it. Given that the emergency intake is not used regularly and has only been used extremely infrequently in the past, the probability in my estimation of these two remote events occurring at the same time -- I am sorry, the remote events of use contingent coincident with the undoing of the sheet piling, we don't feel there is a significant risk, if it is a risk at all.

Further, we believe that in most of the dredging options that we are talking about that when the water is released from behind the bulkheading and has had an opportunity to mix with the other water prior to the time that it reaches the intake that it will probably be diluted on the order of 5 to 15 times, so the concentration should be rather low if that emergency intake is used for that period of time or for some short period of time. And that should not represent a real health risk, I don't believe.

Q You just stated that the water coming from the northern end of the Harbor would be diluted 5 to 15 times by the time it reaches the emergency intake.

A Yes.

MR. HYNES: That is after removal of the bulkheads which is what he said.

THE WITNESS: Right.

BY MR. FEATHERSTONE:

Q Is that approximately what goes on today in your judgment, that is, water somehow moves from the northern end of the Harbor somehow down to the water plant in the southeast corner of the Harbor, that the PCB levels in that water are diluted to approximately 5 to 15 times?

A I haven't really thought of it in quite those terms, but if you take a look at the area in the Harbor compared to the area we are dredging, at least in some of the options, you will find there is that kind of ratio of 5 to 15.

When you consider the fact that the lower parts of the Harbor are deeper than the upper parts of the Harbor, you have a volume of water. The volume of water just doesn't race out and it isn't pushed out as a flood flow. There has to be mixing between the waters that are in the Upper Harbor and those in the Lower Harbor and therefore, dilution must occur.

My rough calculation or rough estimation would be the dilution would be in that range, 5 to 15. That ignores any possibility of 20 to 30 being reduced with the several days that I noted earlier that we would have allowed the sheet piling to remain in place after we finished our dredging.

Q Did anyone on your staff speak to anyone at the Water Plant in the southeast section of the Harbor to discuss these alternatives that you are proposing?

A To the best of my knowledge, they did not.

Q In addition to the dilution that occurs because water from the upper end of the Harbor mixes with water in the southern end of the Harbor, is there also dilution because of inflow of sediment from Lake Michigan, that that cleanses the water, if you will, of PCB?

MR. HYNES: Are you asking does the inflow of sediment from the Lake into the Harbor act to cleanse the PCB levels in the water?

MR. FEATHERSTONE: In the water column, yes.

BY MR. FEATHERSTONE:

Q In other words, helps remove PCBs from the water column?

A Theoretically, I would think that is possible.

I haven't really thought about it that far because as far as I have thought about it, I considered it was not a real risk, but I think theoretically what you say, if I understand correctly, the sediment comes in at the bottom, if those sediment particles contact with water coming through with PCBs, there should be some attachment of PCBs on the soil particles that are in the sediments being transported on the bottom. How much would occur, I really don't know, but theoretically that should occur, at least to some extent.

Q And that process might well explain the reduction of PCB levels in the water column that you find when you move from the northern end of the Harbor to the southern end of the Harbor?

A As I say, I haven't really thought about it, but if I may continue my answer before, the other before I tackle this one, you would also get some dilution because you have water coming in or other material coming in, so you get further dilution at the water treatment intake.

I'm sorry, what was the next question you asked?

Q I don't believe there was a next question. I just wanted to make sure I understood part of your

answer.

Did you or anyone else make any studies of boat traffic in and out of Slip 3?

A I made no studies. You might talk to Mr. Henningson as to what information he reviewed relative to boat traffic in and out.

Q During the time that you were developing these alternatives that are presented in Exhibit 3, did anyone provide information about boat traffic in and out of Slip 3?

A I am sorry, I misunderstood the question before. I thought you said the Harbor.

MR. FEATHERSTONE: Thea, before he goes on, would you read back the question before to make sure I didn't say the Harbor.

(Record read as requested.)

BY MR. FEATHERSTONE:

Q I meant that question to mean provide you with information about the boat traffic in and out of Slip No. 3.

A I believe the only information that we received on boat traffic refers to the entire Harbor and does not delineate Slip 3 from the rest, but I don't know for sure what information Mr. Henningson

has reviewed in that regard.

Q The intent of the question was directed only to the information that you might have had and used in developing your options.

A If I may, excuse me. When we started the depositions we were using "you" a lot for Malcolm Purnie, so you mean to use "you" for me, personally?

Q Yes, that is correct.

A My answer stands.

Q You have given some testimony that some dredging needs to take place in Slip 3 if it is to continue to be used as a slip for boats, is that correct?

A Yes.

Q Do you know how much of Slip 3 is used as a slip for boats?

A The entire northern face is used as a slip for boats.

Q When you say the entire northern face, do you mean that quite literally?

A Yes.

Q Do you know how much room boats in Slip 3 need to turn in Slip 3?

A I don't recollect.

Q Did any one of your staff including yourself consider what the effect might be on sedimentation in Slip 3 if the storm drains and sewers into Slip 3 were shut off?

A Only generally.

Q What was the conclusion?

A It would be reduced.

Q How significantly?

A We did not go that far.

Q I noticed in one of your exhibits to your deposition that someone on your staff made a calculation that with the present sediment rates in Slip 3, that approximately a foot of sediment will be added in a period of 14 to 26 years. Do you recall that information?

A I believe that is approximately correct.

Q I take it nobody on your staff made any projection about the length of time, the approximate length of time for an additional foot of sediment if those storm pipes and sewers were cut off?

A I don't believe they did.

Q Would the discharge of water from the water treatment site or lagoon as you have described it on a couple of occasions require a permit?

A We would hope not, but it is possible.

Q Have you ever considered that before just now?

A Yes.

Q In the consideration that was given to it, what work was done?

A The consideration was that it was not a permanent discharge. It is discharge during construction which is for a short period of time. Generally you don't need a NPDES permit for construction. That is as far as we considered it.

Q I take it that is still unresolved, is that right?

A Everything about the permiting is unresolved in one way or another.

Q Mr. Phelan asked you several questions about whether some of the containment sites would comport, comply with certain Federal laws and there was some discussion about that.

In any of the construction schedules that were set forth in Exhibit 3, did anyone give any consideration to the length of time it might take to get whatever permits and approvals are necessary?

A No, those are construction schedules, not

permiting schedules.

Q The construction as set forth in those construction schedules, I take it, would have to wait until whatever approval was in fact required was obtained?

A Yes.

Q Based on your experience, could the approval process require a substantial amount of time?

A Yes.

Q The dredging that has been proposed for the Harbor in several of these alternatives, would the mere process of sticking that equipment down in the sediment, stir up the sediment and stir up the PCBs in the water column?

A What do you mean by sticking it down?

Q Well, I am not a dredging expert, but I assume that you have to take a piece of equipment and go down into the sediment itself to suck up whatever you are going to suck up, right?

A Float the dredge in. The dredge usually doesn't draw very much water.

MR. HYNES: Are you talking about during the actual dredging operation itself, would the equipment go into the sediment to dredge it up?

MR. FEATHERSTONE: Yes, that is right. That is the question.

BY THE WITNESS:

A Yes.

BY MR. FEATHERSTONE:

Q That would stir up the sediment?

A Yes.

Q Would that tend to stir up the sediment such that just from that limited process, there would be PCBs getting into the water column?

A Yes.

Q Did you make any calculations about how much that dredging process that we just talked about would increase PCB concentration in the water column?

A I have made a rough calculation. It would get up about 70 parts per billion in the water dredged area.

Q 70 parts per billion?

A Yes, that is correct.

Q Do you know how long the PCB levels in the water column would stay that high? That is a seven-fold increase.

A I would say several days, probably the same several days that we would allow the sheet piling to

stay in place, for instance, as one example.

I might also add that that concentration is over a small area and represents a very small poundage.

Q You say it would take several days. Is that based on some calculation you made?

A No, that is being very conservative and allowing for conservative amounts of time for the material to settle back down again. During dredging, there will be roiling up of materials. That is why we closed off the Harbor, so we don't have the sediments escaping from the area that we are dredging.

Q So the several day estimate that you have given me is your judgment of the amount of time it would take for the sediment particles to settle back down again?

A At the worst case, probably far less than that.

Q Does the dredging process itself cause PCBs to separate from the particles that are in the water column?

A I really have no knowledge of that.

Q Is that something that might happen?

A I have no idea.

Q Did anybody bother to check into it?

A I don't think it is an issue of concern because if it separates, it is still going to be above the solubility of the water level, so it is still going to settle again.

Q My question was not in your judgment whether you think it is a matter of concern. My question is did anybody look at that?

MR. HYNES: He already answered that, I believe. You can answer it.

BY THE WITNESS:

A Could you repeat the question, please?

BY MR. FEATHERSTONE:

Q My question is did anybody bother to determine whether during the dredging of the sediments, the PCBs would separate from the sediments and enter the water column?

A I bothered, yes, and I gave you the answer before.

(Mr. Richard Kissel left the deposition room.)

BY MR. FEATHERSTONE:

Q There has been some testimony, Mr. Brownell, about conditions in the Harbor. Do you remember

generally giving testimony about that?

A I believe I gave some general statements about that.

Q One of the statements I believe you made is that during flood conditions, additional quantities of PCBs might move from the Harbor to the Lake. Is that your opinion?

A Indirectly I believe it was.

Q Did you or anyone at Malcolm Purnie make any calculations about the amount of PCBs that might move from the Harbor to the Lake in a flood if nothing were done in Waukegan Harbor?

A Not to this date, no.

Q When during your testimony you referred to flood conditions, were you referring to the 100-year flood, so to speak?

A We did discuss a 100-year flood at one time, but there are all kinds of floods. We can have a 200-year to 500-year flood tomorrow, well, maybe several days from now depending on change of weather conditions.

Q When you gave testimony that flood conditions might increase the movement of PCBs from Waukegan Harbor to Lake Michigan, did you have in your mind at

that time, any particular flood?

A No, not when I made that specific statement.

Q Is the topography of the Harbor important in determining whether and to what extent PCB material might move from the Harbor into Lake Michigan because of flood conditions?

A To a certain extent.

Q Is there anything about the topography of Waukegan Harbor that in your judgment would tend to minimize the amount of PCB material that might move from Waukegan Harbor to the Lake in a flood?

MR. HYNES: Minimize as compared to what?

MR. FEATHERSTONE: If something weren't there, would it be greater?

MR. HYNES: You said minimize. You have to compare it, make a comparison to something else. If the breakwater wasn't there --

BY MR. FEATHERSTONE:

Q Mr. Brownell, my question is are there features of Waukegan Harbor that in your judgment tend to reduce the amount of PCB material that might move from Waukegan Harbor to Lake Michigan in a flood as opposed to a situation in which those features in Waukegan Harbor weren't in fact there?

A Well, there are some features that minimize and some features that maximize.

Q What are those features that minimize?

A The drainage area that contributes to the Harbor is relatively modest, at least to Slip 3 and the North Ditch area is relatively modest. On the other hand, the North Ditch and the Crescent Ditch is unlined, and so as you get some significant velocities through that channel, you are going to move sediment and with the right conditions, the sediment is going to move right out into the Lake and taking PCBs all the way.

Q My question was only concerning Waukegan Harbor. Is there anything about the configuration of Waukegan Harbor itself that would tend to minimize or reduce the amount of PCB material that might move from Waukegan Harbor to Lake Michigan in a flood?

A Again, the drainage area is small, but my concern is more from the floods induced from the Lake as opposed to rainfall from the Harbor part. Rainfall concerns me in the Ditch.

Q When you say floods induced by the Lake, I take it you are talking about floods that are caused by changes in lake elevation?

A Yes.

Q Have you or anyone else at Malcolm Purnie made any calculation as to how much of a change in the elevation of lake level there would have to be to create a flood that concerns you?

A No, not to this point.

Q Do you have any way of doing that right now?

A Not right this minute, no.

Q You would need more information of the type I probably cannot provide you?

A I would have to check with my staff and see how we might go about doing that. But you certainly piqued my curiosity.

Q Every now and then I do that in these sessions.

You testified earlier, Mr. Brownell, that if the drainage pipe into Slip 3 were rerouted, that change might change your opinion as to the preferred remedy for the Harbor. It is on Page 105 of your deposition.

How would rerouting of the drainage pipe into Slip 3 affect your opinion as a preferred remedy for the Harbor?

A I would have to go back and review and I would be happy to do so during lunch, for instance, or

what I said on those particular pages.

Q Well, putting aside those particular pages, we may be done before lunch, at least I would like to be.

Can you tell me now how the rerouting of the drainage pipe into Slip 3 would or might change your opinion as to the preferred remedy for the Harbor?

A Well, it might change my thinking insofar as it will reduce the rate of sedimentation if we move the drainage pipes that we know of that discharge water and sediment in the Harbor, the Slip 3 area.

I really have to go back and review. I don't recollect saying exactly those words and I am up to 500 pages of deposition, so I would like to go back and review and see exactly what I said, but I believe that it would.

Q I don't believe the question and answer ever got any more specific than what I just related, so I don't think you have boxed yourself in on anything. I am just trying to understand how that statement came about related to the sedimentation rate in Slip 3.

A Yes, it relates to it. We still have a problem in Slip 3 in that the silt levels are fairly high right now. That is all I have to say about that

at the moment.

MR. FEATHERSTONE: I have no further questions.

MR. PHELAN: None.

MR. HYNES: Thank you.

(Witness excused.)

FURTHER DEPONENT SAYETH NOT. . .

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

THE UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	No. 78 C 1004
	)	
OUTBOARD MARINE CORPORATION and MONSANTO COMPANY,	)	
	)	
Defendants.	)	

I hereby certify that I have read the foregoing transcript of my deposition given at the time and place aforesaid, consisting of Pages 1 to 749, inclusive, and I do again subscribe and make oath that the same is a true, correct and complete transcript of my deposition so given as aforesaid, as it now appears.

_____
Richard P. Brownell

SUBSCRIBED AND SWORN TO
before me this _____ day
of _____, A.D. 1982.

_____
Notary Public.

UNITED STATES OF AMERICA)
NORTHERN DISTRICT OF ILLINOIS)
EASTERN DIVISION) SS:
STATE OF ILLINOIS)
COUNTY OF COOK)

I, Thea L. Urban, a notary public in and for the County of Cook and State of Illinois, do hereby certify that RICHARD PAUL BROWNELL was by me first duly sworn to testify the whole truth and that the above deposition was recorded stenographically by me and was reduced to typewriting under my personal direction, and that the said deposition constitutes a true record of the testimony given by said witness.

I further certify that the reading and signing of said deposition was not waived by the witness and his counsel.

I further certify that I am not a relative or employee or attorney or counsel of any of the parties, nor a relative or employee of such attorney or counsel, or financially interested directly or indirectly in this action.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal of office at Chicago, Illinois, this _____ day of _____, A.D. 1982.

Notary Public, Cook County, Illinois
My commission expires May 31, 1983.

I N D E X